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# I.M.E.A. Policy

## *Advocacy of Public Ownership*

IN all considerations of the future of the electricity supply industry (and consequently of the electrical industry as a whole) two unanswered questions stand in the way of the production of any definite scheme of reorganisation. The first affects the industry itself: whether it is to come under public ownership or control. The other is the wider matter of whether it is to be co-ordinated with the gas industry, wholly or partly.

These are questions which must be answered together. It is hardly likely that a publicly-owned electricity supply would be forcibly allied to a privately-owned gas industry—or *vice versa*. Consequently, although there has not been so much said about it in gas circles, the gas industry is equally interested in the question of public ownership.

### National or Municipal?

At their annual meeting last week members of the I.M.E.A. expressed impatience at the slow progress made by their Council in the matter of formulating a post-war policy. Our sympathies are with the Council, having regard to the uncertainties of the situation. The Council seems to have made up its mind on one point—that electricity supply shall be publicly owned. But the expression of a principle does not settle the form. It is still not clear whether the Association aims at national ownership or (as is more likely) municipal ownership, perhaps in the shape of groups of some kind. However that may be, it is quite certain that the Association advocates the elimination of private electricity supply companies.

In breaking away from the private interests to form a committee of its own to consider post-war reconstruction it seems to have abandoned all hope of agreement within the industry and to this extent has made the way easier for the imposition of a plan from outside. But it may be presumed that the last word has not yet been said by the companies, who are by no means moribund. It is possible to have public control without public ownership, and stress of circumstances has caused many former opponents of the McGowan proposals to look more favourably upon them lest worst befall.

### Gas-Electric Co-ordination

If reorganisation is largely a political matter so is the suggested co-ordination with gas, but here there are also strong economic arguments as well—specious though some of them may be. We know what the ideas of the gas industry are on this subject. A proposed "electrical" solution of the problem (referred to by the I.M.E.A. president) is that all gas should be sold to the electricity supply industry to be used in gas turbines (or possibly gas-fired boilers) for electricity generation, electricity being used for all purposes. The important gas by-products would thus still be available. There are obvious objections; one of them, which was also mentioned by Mr. Newey, is the problem of disposing of the low-grade coal which can only be used by electricity

supply concerns. But surely this would still be needed if the industry took over the whole of the present gas business.

**An I.M.E.A. Director ?**

THE I.M.E.A. Council said in its report that it had " agreed in principle " to the appointment of a director of the Association. It seemed clear at the meeting that the matter had gone further than this and that the appointment had actually been decided upon; it only remained to find the man. Interviews have already taken place and among those who have been approached is a prominent member of the gas industry. Some members questioned the wisdom of this approach but the Council remained unperturbed. Maybe it is proceeding on " poacher-turned-gamekeeper " lines or, again, it may be preparing for the possible co-ordination of gas and electricity and wants a man with a foot in both camps.

**" Sterilised " Areas**

ELECTRICITY undertakings may expect to receive compensation for war-damaged cables and other distribution equipment but what of the systems in devastated areas which will never be " built-up " again or at least will be reconstructed on entirely different lines ? The subject was raised at the I.M.E.A. meeting by two engineers whose undertakings have been badly hit—Messrs. H. Midgley (Plymouth) and H. E. Blackiston (Swansea) and replied to by another—Mr. J. W. J. Townley (West Ham). Mr. Townley said that it would be sought to have protective clauses inserted in future legislation to cover this point. Nothing was said regarding the possible recovery and re-use of the plant and cables. Although salvage may be expensive, possibly to the point of prohibition, this question will no doubt be raised.

**Spanish Industry**

A RECENT report from Spain says that there are now 544 electrical manufacturing concerns in that country capable of satisfying much of the home demand. It is said that the industry as a whole produced goods to the value of about £11,000,000 in 1942. In the preceding year the value of electrical imports was only about £246,000. This approach to self-sufficiency does not mean a great deal to the British electrical manufacturing industry as a whole, but certain companies having special associations with Spain may feel the pinch. In 1941 Great Britain's share of the Spanish import trade was only between £5,000 and £6,000, although in the first half of 1942 the figure was £9,890. The last complete British figures, those for 1938, showed that we sent goods and apparatus to the value of £45,697 to Spain; machinery exports were not deemed worthy of separate mention. The country was the least important of our overseas customers; the figure quoted represented only 0·34 per cent. of our total exports of electrical goods and apparatus.

**The Red Cross Fund**

WHEN the Electrical Industries Red Cross Appeal was launched by the late Lord Hirst in January it was realised that many firms in the electrical world, and their employees, were already doing something to help the great work of the Red Cross and St. John Fund. It was felt, however, that most of them would be willing to make a special *electrical* response, commensurate with the size of the industry. About 5,500 firms were approached, mainly through their trade associations, but so far only 236, a little over 4 per cent., have done anything about the matter. It is felt that this is not just lack of interest but probably a kind of inertia and accordingly a second appeal has been circulated. The cause is an excellent one and the electrical industry should be proud to be identified with it. We therefore ask all company directors and heads of firms to give their attention to this matter, following the examples of many in their own branches.

**Power Factor Correction**

WE reported recently that it had been ruled that condensers for correcting the power factor of fluorescent lighting installations came within the scope of the Control of Industrial Electrical Equipment Order and could therefore be obtained only by licence. The Electricity Commissioners have asked supply undertakings not to refuse to connect uncorrected fluorescent lighting and welding installations if they can do so without upsetting their systems or using up more materials or extra cables and equipment than would be required to provide the condensers.

# I.M.E.A. Annual Meeting

## *Preparations for Post-War Reorganisation*

BEFORE the annual general meeting of the Incorporated Municipal Electrical Association was held at the Connaught Rooms, London, W.C., on June 18th, an extraordinary general meeting took place for the purpose of considering alterations to the Articles of Association. Mr. F. Newey (city electrical engineer, Lincoln), president, was in the chair.

The first revision was to allow for female representatives of local authorities as well as male representatives. The second was to permit the election of more than one honorary member each year.

There were one or two other minor alterations, but there was also a proposal to permit a local-authority representative to be elected as president of the Association every third year. At present only engineer representatives can hold the position. An amendment was moved by Alderman Lancaster (Fulham) that a local-authority representative should be elected every other year in view of the fact that in the future matters of ownership and management of municipal electricity undertakings were likely to be more prominent than technical matters. In technical matters a local-authority president would always have a technical vice-president to fall back upon for advice.

**The President with Alderman W. Walker and Mr. E. E. Hoadley (hon. secretary)**

Alderman Hobson (Willesden) supported the amendment, stating that many members of electricity committees had technical knowledge and were fitted technically to occupy the chair with the assistance of a technical vice-president. The president explained that the matter had been considered but the general view was that as the Council comprised of two-thirds engineers and one-third local-authority representatives, the proposal should bear some relation to that.

The amendment was defeated and the Council's proposal for every third year, together with the other alterations to the articles, were then agreed to.

### Report Discussed

The annual general meeting was then held, and the President briefly introduced the report of the Council, which was summarised in last week's *Electrical Review*. Mr. W. P. Lilwall (borough electrical engineer, Fleetwood, vice-president) seconded its adoption.

On paragraph 20, which stated that the Council had agreed in principle to the appointment of a director, Alderman Johnson (Southend) asked what the functions of the proposed director would be and what salary was to be paid to him. He further inquired if it was true that members of the Association and a gentleman formerly connected with the

gas industry, and now with the Ministry of Fuel and Power, had been approached with regard to the appointment.

The President emphasised that no decision had yet been come to. A special committee had been appointed and certain gentlemen had been interviewed, including the one to whom reference had been made, because the Council was determined that if a director was appointed he would be a man of the right type to carry out the duties. But no question of an appointment had yet arisen nor had the question of salary been determined.

Mr. J. A. Sumner (city electrical engineer, Norwich) said that, assuming that there was a necessity for a director, he felt it was very inopportune to appoint one when the whole supply industry was in a state of flux and nobody knew what would happen after the war. There might probably be an Electricity Board and, equally probably, there would not be any need for an I.M.E.A. Again, if a director was appointed and a mistake was made, the position would be much worse than not appointing a director at all. Apparently the man for this post would have to have the entry into social, political and official circles now and he would have to be paid a high salary. It was not conceivable that anyone would leave a good post to take the directorship with the future of electricity supply so uncertain. He moved that the Council should defer the appointment of a director until a period of six months from the termination of the present hostilities in Europe.

Mr. W. E. Affleck (borough electrical engineer, Guildford) seconded the resolution. In his view, there was no need to go outside the electricity undertakings if such a man was necessary, but he saw no need for a director.

Alderman W. Walker (Manchester) said there was misconception on the part of the last two speakers and neither of them had developed any arguments which justified a change of opinion on the part of the Council. The Committee that dealt with this matter recommended that no contract should be for more than three years. The Council was of the opinion that there should be, in the critical period ahead, someone who was in contact with Government Departments and Ministers and every kind of committee that might be set up to settle the fate of the supply industry, and it must be a full-time appointment for a man of that calibre.

**Mr. W. A. Royle (Sunderland), Councillor W. Worthy, Mr. J. W. J. Townley (West Ham) and Alderman E. W. Ditchburn (Sunderland)**

It was common knowledge that in all political parties there was a distinct intention to proceed with legislation to deal with the electricity supply industry, and to appoint a man to deal with the situation three years after this had all been settled was no use at all. Other industries had such a man and something was known of the salaries being paid, and it was further known how effective

**At the table on the President's right: Mr. H. C. Lamb, Alderman W. Walker, Mr. J. W. J. Townley and Mr. W. P. Lilwall**

their work had been. The comparatively small amount involved would be returned over and over again in the results obtained from adopting the course the Council had in mind.

Mr. A. G. Connell (Halifax) suggested that this matter should be left to the Council, which was fully advised as to the whole of the implications.

**Mr. R. O. Seville (Wakefield), Alderman J. W. Milner (Mayor of Wakefield) and Mr. T. H. Carr (Derby)**

Mr. Ivor Thomas, Alderman Lancaster and Alderman Hobson (Willesden) supported Mr. Sumner's resolution.

Mr. H. E. Blackiston (Swansea) expressed the view that the resolution was entirely mistaken. If the I.M.E.A. did not do something and make an appointment of a political kind in the interests of municipal electricity undertakings, the gas companies would "beat them to it" and so also would the electricity supply companies.

Alderman E. Porter (Blackburn) said that the electricity supply companies already had such a man. Private enterprise had not to meet a critical body such as this meeting. A large private undertaking appointed a director and gave him full power to act in the interests of the shareholders. It was no good saying that this matter should be left until after the conclusion of the war.

The President said that, apart from a small paid secretariat, the work of the Association was carried on voluntarily and engineers and members of committees had to leave their other duties to do it. It was a full-time job to settle down to a scheme of reorganisation for such an enormous and complex industry. It was all very well to say "let the Government Department prepare a scheme and we will criticise it," but nobody with the courage of his convictions would be prepared to accept that method. They must come forward with their own scheme of public ownership.

**Messrs. B. Handley (Portsmouth), Alderman Captain C. Saer (Fleetwood) and Mr. T. A. G. Margary (Wolverhampton)**

**On the President's left: Mr. E. E. Hoadley, Mr. J. W. Simpson (secretary), Alderman J. R. Potts (Carlisle) and Councillor J. Selwyn-Jones**

As to money, the Association had £15,000 in reserve and they could not afford *not* to appoint a director to do this job. It had to be done, otherwise local authorities would probably have no undertakings to bother about in a few years time. As to the criticism of the approach to a man in the gas industry, was it not often good policy to buy out one's enemies! However, that was a matter which had yet to be determined. The aim was to get the best man for the job.

Mr. Sumner's resolution was put to the meeting and declared lost and the President thanked members for their confidence in the Council.

On paragraph 24 (Post-War Reconstruction) Alderman Hobson asked if the Council had considered the report issued by the London and Home Counties Joint Electricity Authority. The President replied that the special committee appointed to deal with post-war reconstruction had had before it numerous schemes including the one mentioned but no report had yet been received from that committee.

**Left: Messrs. H. Midgley (Plymouth) and A. E. Clark (Stretford). Right: Mr. W. P. Lilwall, the vice-president**

Councillor W. Hebden (Shoreditch) expressed the hope that in any reconstruction of the industry full advantage would be taken of the skill and initiative of the engineers in the industry and added that if the electricity supply industry was to be reconstructed in the public interest he did not see how the gas industry could be left out.

Alderman Shaw (Walthamstow) protested at what he called the futile discussions that had taken place with the companies. It was apparent that the companies did not desire reconstruction of the industry. The I.M.E.A., however, was concerned with the future of the industry as a public service and the Council had appointed a special committee to deal with the matter, but so far there had only been three meetings and there had been no report or recommendations. He maintained that the I.M.E.A. had failed lamentably in dealing with this matter and hoped that in the near future there would be a report from the special committee showing the Government how the industry should be built up in the future under public control and in the public interest.

A local authority representative complained of the position in his area where the local Council had powers to erect a power station but the Electricity Commissioners had allowed a private company to build a power station just outside the area. There had not been one word of protest by the I.M.E.A. on behalf of the local authority. He claimed that this clearly showed what the policy was going to be after the war. The President said this was the first the Council had heard of this matter. If it had been brought to the notice of the local Centre it would have been passed on to the Council but it had not been. In reply to Alderman Shaw, he said the Council hoped to bring forward a constructive scheme for the consideration of the members.

Dealing with pafagraph 26 (War Damage—Public Utility Undertakings), Mr. H. Midgley (city electrical engineer, Plymouth) said that areas which had been considerably devastated would have to be re-planned and that might mean a material difference in the lay-out and would render redundant a considerable amount of mains and sub-stations and, consequently, capital lying idle. A large amount of new capital would have to be spent to supply the re-planned area and there should be compensation for the capital rendered non-remunerative.

Mr. H. E. Blackiston (Swansea) said this position was very acute also in Swansea, where there were mains lying in streets representing £500,000 which could not be used; the undertaking should be awarded £500,000 for war damage. The mains had already been paid for or largely so, but still had a long life, yet the compensation would only be on the basis of the unrepaid capital.

Mr. E. E. Jolly (Bethnal Green) spoke on the matter from the London point of view and said that under the Housing Act, 1936, there could be no claim for compensation, especially in the L.C.C. area, if the area had been scheduled for re-development before the war. If such an area had been severely damaged there could be no claims for compensation for mains and in London this was going to be very serious. His own authority was trying to get some arrangement under the Housing Act, 1936, which, in his view, now became obsolete.

Mr. J. W. J. Townley (chief electrical engineer, West Ham) dealing with these points said that provision was proposed in the Public Authorities (War Damage) Bill for a repairs payment for damaged plant or equipment or property, and a value payment for destroyed assets. In the case of cables which had an outstanding value although no book debt existed, surely the answer was that no war damage completely destroyed a whole distributor or feeder and therefore the full amount for repairs would be paid. A promise had been given that some attention would be paid to the question of complete destruction of plant and equipment on which there was no book debt. There was a depreciation schedule which could be used but that did not apply to Mr. Blackiston. This point was being pursued by the Joint Committee.

On the other point mentioned by Mr. Midgley, it was clear that electricity supply systems in damaged areas would not be reinstated as they were before. In the case of the repair value they were entitled to compensation as though reinstatement was to be as the system was before, but as regarded abandonment, protective clauses would have to be sought in the Town Planning or Reconstruction Bill which would come before Parliament.

The report of the Council was adopted and Mr. Townley then announced that Mr. Newey had been re-elected President.

### Co-operation with Gas Industry

The President, acknowledging his re-election, said that a year ago they were honoured by the presence of the new Minister of Fuel and Power, Major Lloyd George, who had just taken over his new responsibility for all fuel supplies. During the past year, the Minister had had an opportunity of gaining a more intimate knowledge of the efforts the industry had made in the national interest.

Major Lloyd George had recently made suggestions that more co-operation between gas and electricity interests would be necessary after the war, and this pronouncement had caused no little concern in many directions. Why electricity supply authorities should be alarmed at this statement was not clear. So far as he was aware there had been no criticism of the conduct of the supply industry. The various reports issued on post-war development stressed the need for an adequate supply of electricity, particularly in the rural areas.

They had been told by the Minister that the consumer must be allowed to choose either electricity or gas. If this were true, what had the electricity supply industry to fear? During the past twenty years the public had made their choice and the rapid development of the electricity supply industry was the answer. The electrical requirements of domestic consumers would be greatly increased as a result of wartime development; therefore, any co-operation with gas must be found in other directions. Everybody agreed that the nation's coal must be preserved, and here electricity was making a substantial contribution by the full utilisation of water power.

It was generally admitted that by-products of coal should be utilised to the full, but the inferior coal used in most generating stations was incapable of use in any other way. The recent report of the Parliamentary and Scientific Committee stated that the growth of the electrical industry had created a market of inestimable value for the utilisation of low grade coal. Electricity was usually generated by utilising the lowest grade of coal which was quite unsuitable for other purposes; indeed, this inferior fuel must be removed from the pit to enable the better coal to be taken out. Coal consumption had been reduced during the past few years from 3½ lb. to 1½ lb. per unit generated. Had any other industry such savings to its credit?

How, then, was co-operation possible?

**A Scottish group at the meeting including Messrs. J. Edward (Edinburgh), C. Baird (Dundee), J. Davis (Glasgow), P. Philip (Dundee), W. T. Jeffrey (Kirkcaldy), G. Morgan (Glasgow), G. F. Moore (Kirkcaldy) and J. N. Atkinson (Perth).**

The answer surely lay with the gas industry, which must provide the electrical industry with heat units at the right price. The gas industry must encourage research into the production of an efficient and reliable gas turbine or other means of generating power. The electricity supply industry must have economic prime movers—they only required mechanical energy at no greater "all-in" cost than modern steam turbines with expensive boiler plant.

Electricity had proved its reliability under the stress of war and was most vital to the war effort. Electricity would be equally vital in post-war reconstruction and they must be prepared for the demands which would be made for their service.

After a vote of thanks had been accorded the President for his services during the past year, it was reported that Mr. P. Lilwall had been re-elected vice-president for the coming year. A vote of thanks was accorded to the hon. treasurer, the hon. secretary and the permanent secretarial staff.

# Red Cross Appeal

## *Further Letter to the Industry*

SINCE the Electrical Industries Red Cross Appeal was made about five months ago companies, firms and individuals in all branches (including the electricity supply industry) have either made donations or signed covenants for seven years or the duration of the war. But these are but a small proportion of the whole and in consequence the Executive Committee has deemed it desirable to send out a reminder to those who may have overlooked the late Lord Hirst's original letter.

### "So Far So Good"

This second letter is in the following terms:—

> The Electrical Industries Red Cross Executive Committee, after careful consideration, do not propose to seek a successor to the late Lord Hirst as Chairman of the Combined Appeal of the British Electrical Industries, believing that the Chairman would have desired the Campaign to continue without interruption.
>
> In his Appeal, dated 14th January, 1943, Lord Hirst said: "The object for which these funds are needed must commend itself to all of us." "All of us."
>
> We must be frank: the Appeal was addressed to 5,500 Electrical Firms and Undertakings; 236 responded. 130 have presented Donations totalling £5,886. 106 have signed the Covenant for amounts aggregating £8,801 per annum.
>
> So far so good—but only so far.
>
> The Committee is convinced that this great Industry will do vastly better. They ask most earnestly—for immediate reconsideration in those cases where response to the first Appeal was deferred—for immediate consideration where it had escaped attention.
>
> Details of the Appeal are repeated on the reverse side of this letter and again the advantages of the Deed of Covenant are specially commended to your attention.
>
> All contributions will be acknowledged in the Technical Press.
>
> Both the Electrical Industries Committee and the Red Cross Organisation will be grateful for any contribution, large or small, but—much more important—the sick, the wounded and the lonely prisoners of war will be grateful.
>
> In our first Appeal it was said: "It is nothing less than our duty to support this great effort"—it might well have been "our privilege."

On the reverse side of the letter the principal points of the original appeal are set out. It is stated that over £19 million has been collected by the Duke of Gloucester's Red Cross and St. John Fund since the beginning of the war, but the balance in hand is small in view of possible future demands. Services to prisoners of war alone cost something like £4½ million a year.

The many-sided work of the organisation is outlined to emphasise the need for substantial funds and in conclusion it is stated that while donations are very useful and welcome, covenants to pay an annual amount for the duration of the war are far better, for the organisation can recover income tax upon them, thus doubling the benefit.

Accompanying the letter is a list of those who have already signed covenants or sent donations. It is a very representative list showing at least that firms in all sections of the electrical industry have displayed interest in the Appeal and have thus provided examples for their fellow-members to follow.

Cheques should be addressed to the Electrical Industries Red Cross Fund, St. James's Palace, S.W.1. Further information can be obtained from the Joint Secretaries, Electrical Industries Red Cross Appeal, c/o 2, Savoy Hill, W.C.2.

### Ninth List

The latest list received from the organisers shows that Associated Electrical Industries, Ltd., has entered into a covenant for £50, raising the total gross annual amount of covenanted subscriptions to £8,826 12s. The following donations have also been received: Ellesmere Port Electrical Co., £2 2s.; Borough of Preston, £50; W. Vaughan-Shaw, £2 10s.; H. Armitage, £7; and H. Curtis, £10. These raise the total amount subscribed in this way to £5,930 18s.—a grand total of £14,757 10s.

# Electricity Supply Plans

## *Further Views on Reorganisation*

### From a Correspondent

LIKE many another industry, the electricity supply industry is due—some consider overdue—for reorganisation, and a great deal of attention has been paid to the matter in recent issues of the *Electrical Review*. Numerous reports have been published from various quarters revealing a wide divergence of opinion as to what is best for the industry, or rather for its consumers. Any reorganisation must benefit the public, even though the trend of events seems to suggest that the consumer has been forgotten. Electricity is a public service and, if it is to be administered for the public good, it should be under some form of public control.

There are two important and distinct bodies generating and distributing electricity —the municipalities and the private companies, each doing good service, but each with very distinct points of view.

It has been argued that the two bodies could meet and agree on certain principles, such as standardisation of voltage, basis of charges, etc., but surely evolution will accomplish this. The solution of universal electricity supply is organisation, and therefore the first step is to decide on the type of ownership. When this has been decided, the next step is the division of the country into suitable areas of management. In this connection it would seem that the recommendations of the McGowan Report are being more favourably considered than they were originally, but no one in the industry has yet any idea of the lines upon which the Government will proceed.

#### Government to Formulate Principles

If it has been decided to have some form of public ownership, the Government should *not* seek the views of the respective associations at present responsible, but should submit to those bodies, the principles which the Government is inclined to consider favourably, asking the industry for its views thereon. At least the industry should know what the Government has in mind before unnecessary time is wasted in preparing a scheme or schemes which will not be constitutionally acceptable.

The electricity supply industry was asked some time ago to prepare its proposals, but no tangible result has yet been produced. The inertia which has prevailed has been due to sectional interests. The Joint Committee of Electricity Supply Associations, which was set up to consider all matters arising during the war affecting electricity undertakings, expressed the opinion after some months that it would be better to form yet another *ad hoc* committee to consider the problem. This committee has not been able to meet. One of the constituent associations has not yet appointed its representatives, as it is itself considering certain proposals.

It is perfectly clear that, with these divergent views, more than one set of proposals will be submitted and these may be so conflicting in policy that the Government will be unable to accept any of them *in toto*. Primarily the question of reorganisation is not a technical one, but one which requires sound organisation and administrative ability, as the main issue depends upon what system of control and administration is required in order to reduce to the lowest limit the many anomalies now existing. Technical assistance will obviously be required in considering problems affecting voltages, bases of charge, and general management matters, but this is the second stage in reorganisation.

#### Too Many Associations

There are too many associations within the industry with which the Government has to deal. It therefore cannot possibly receive the "considered views of the industry." The time has come to reorganise the associations and to form a "British Electricity Supply Federation" which could speak with one voice. This has been mooted on several occasions during past years, but nobody is strong enough to take the lead. There are at present six electricity supply associations, all more or less carrying out the same functions. In any reorganisation such a Federation would act as the medium between all authorised undertakers and the Government, and it would deal with all matters connected with the industry, such as development, propaganda, research, etc.

A further point worthy of mention is that post-war schemes are being considered by those who will, owing to their age, soon retire from "active service." The younger generation who will shoulder the responsibilities and who are gifted with great ability and leadership are not permitted, owing to force of circumstances, to give their views and take a prominent part in formulating proposals. While it is admitted that many of the present leaders in the industry are men with great foresight whose advice cannot and should not be ignored, there are, on the other hand, a great number

who are biased and have a strictly parochial outlook. The question is a national one, demanding broadmindedness and vision.

Another point which should be considered is the codification of the Electricity Supply Acts.

In conclusion the following points seem to emerge:—

1. If the Government is determined to reorganise the industry, it would be in the interests of all concerned if it first submitted its proposals to the respective associations.

2. Electricity supply, being a public service, should be under some form of public control.

3. The country should be divided into regional areas, corresponding to those of the Central Electricity Board, and Regional Committees should be set up in each of these areas, consisting of representatives of undertakings in the area. A National Distribution Board should also be set up composed of representatives of the industry, with an independent chairman. Some of its duties might be:—

(*a*) To consider all matters referred to it by the Regional Committees and to make decisions thereon. Failing agreement between the National and Regional Committees all matters could be referred to the Electricity Commissioners, whose decision would be final, provision being made for both parties to obtain representation at this final arbitration.

(*b*) To make a levy on all statutory electricity undertakers in the country for the purpose of defraying expenditure incurred under the scheme.

(*c*) To provide for the payment of 50 per cent. of the salaries of the electrical engineers in the areas, whose appointment and dismissal would be subject to the approval of the National Committee.

4. The reduction in the number of distributing authorities should not be dependent on the scheme for the reorganisation of local government areas. Municipal control would not be accepted by Parliament. There is a suggestion that the number of local government areas should be reduced, and that they should be " self-contained " for all purposes.

5. The codification of the Electricity Supply Acts.

6. The formation of a British Electricity Supply Federation, similar to the Federation of British Industries.

7. The abolition of sectional associations as national bodies.

8. Sound economic planning cannot be attained in any industry, where divergent views on management exist.

9. Complete co-ordination within the industry, by the industry, is improbable.

10. The electricity supply industry should manage its own affairs, be self-contained and not dependent for certain action on other bodies, whose composition includes representatives other than " electricity representatives."

# Water Tank Corrosion

## *Suggested Remedies*

PREMATURE failures of galvanised hot water tanks connected to copper circulating pipes in household systems caused laboratory investigations and extensive examination of service installations to be made by the British Non-ferrous Metals Research Association.

The findings are reported in a paper by Mr. L. Kenworthy, submitted to the Institute of Metals, showing that failure is not due to direct electrolytic action, but to very slight dissolution of copper by the circulating water. Severe corrosion follows the subsequent deposition of the dissolved copper on to the galvanised coating, such attack being greatly accelerated by a concentration as small as 0·01 part of copper per $10^5$. The severity of attack generally tends to diminish with time (particularly with hard waters) presumably owing to the formation of protective scale, so that the greatest damage to galvanised parts of the system is liable to occur in the early stages of the life of installations.

Such factors as design of installations and operating conditions make it difficult to draw a sharp line of demarcation between those waters which are unsafe and those which are quite suitable for use in systems composed partly of copper and partly of galvanised iron. But it seems that the use of water containing more than 0·2 part per $10^5$ of carbon dioxide (irrespective of hardness) is generally inadvisable. When the combination of metals cannot be avoided, cupro-solvency may be considerably reduced by appropriate treatment of the water; if the water is hard its aeration (by cascading) is recommended, while the addition of lime to softer waters increases temporary hardness and absorbs free carbon dioxide.

If neither of these remedies is applicable, then copper dissolution may be minimised by maintaining a very small concentration of zinc salts (either chloride or sulphate) in the water; 0·05 part per $10^5$ (expressed as zinc) appears to be about the optimum concentration, although a figure cannot be quoted with certainty. Alternatively the insertion in copper piping of small 3-in. lengths of galvanised piping at not more than 10 ft. intervals will provide a fair degree of cathodic protection.

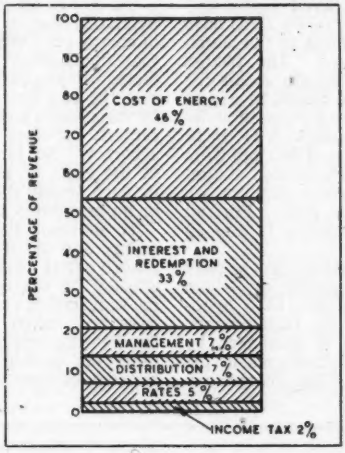
It is suggested that pre-treated aluminium-brass tubing, which resembles copper in appearance and ease of fitting, will result in very much less copper dissolution. Tests have indicated that the copper concentration of water before it comes into contact with the sides of the galvanised hot-water container can be reduced by a filter (consisting of a receptacle packed with zinc turnings) placed in the container over the flow-pipe entrance.

# Costs and Tariffs

## *Analysis of Relevant Statistics*

By F. J. Elliott, M.I.E.E.

LIKE the head of King Charles in "David Copperfield," the relative importance of cost of service and value of service invariably obtrudes into all discussions on tariffs in the electricity supply industry. Nevertheless, I have been unable to find any evidence that the two methods of assessment produce results differing to any appreciable extent. Far too much emphasis has been laid on the alleged singularities of the costs associated with the generation and distribution of electricity. It is not the only commodity in every-day use which cannot be stored or in which the total costs can be divided into fixed and running charges. Its costs, like those of other commodities, are, to a large extent, predictable, These contentions can be substantiated by an analysis of the relevant statistics published in the Annual Returns of the Electricity Commissioners.




**Dispersal of revenue; all local authority undertakings selling over 10 million kWh per annum**

The allocation of the revenue of all local authority undertakings having an output of 10 million kWh or more in 1938 is depicted in the accompanying diagram. Investigation has been confined to local authority undertakings because their financial structure is basically similar. The undertakings dealt with comprise 26 per cent. of the total number of authorised distributors, supplying 52 per cent. of the consumers in the country with 53 per cent. of the kWh sold in that year. Their output varies from 10 million kWh supplied to some 6,000 consumers to 760 million kWh supplied to 250,000 consumers.

By treating the relevant features of these undertakings in the aggregate as though applying to a single undertaking, a reasonably accurate picture of the industry as a whole is obtainable. The costs and revenue here relate to the purchase and sale of electricity only, and since in theory there is no dispersal of profit in local authority undertakings, it is assumed that the revenue collected is sufficient only to meet costs.

Considering the costs shown in the diagram, income tax is based on gross profit after allowances have been made for wear and tear, etc. The rateable value of all public utility undertakings is arrived at by assessing the rent which a fair-minded tenant can afford to pay. Costs of repairs and maintenance of a given distribution system depend primarily on the extent of the area supplied, the number of premises supplied and the geographical apportionment of those premises in the area. Management is entirely governed by the number of consumers, except for the Electricity Commissioners' charges usually included under this heading, these being based on the size of the undertaking, a portion being calculated on kWh sold and the remainder on revenue.

No one of these costs except the Commissioners' charges is affected in the slightest degree by either the system maximum demand or the kWh supplied. The first two costs are functions of profit and the last two of the number of consumers.

The apportionment of capital expenditure on distribution for all undertakings in 1929 and 1938 is shown in Table I. The variation in the ratio between the expenditure on each portion of the system is small, except in the case of meters where an increase of over

TABLE I

| Capital Expenditure on Distribution | Per cent. of total 1929 | Per cent. of total 1938 |
|---|---|---|
| Land and buildings .. .. | 5·46 | 5·54 |
| Plant and machinery .. | 16·68 | 16·06 |
| Mains and services .. .. | 69·57 | 69·59 |
| Meters .. .. .. | 5·96 | 8·11 |
| Other distribution purposes .. | 2·33 | 0·7 |
| | 100·00 | 100·00 |

2½ per cent. has occurred undoubtedly due to a greater use of prepayment meters.

The purpose in drawing attention to these figures is to stress the fact that 70 per cent. of distribution capital has been expended on account of mains and services, and it will be agreed that, like the maintenance costs, the capital costs of this portion of the distribution system are largely governed by the extent of the area supplied, the number of premises supplied, and the apportionment of these premises over the area. A distribution system is laid down to meet the maximum demand anticipated many years ahead, and capital charges are therefore affected by increase in maximum demand only after a time lag and not by the kWh supplied.

At this stage 54 per cent. of the costs have been reviewed without coming to the actual commodity to be purveyed. The factors affecting such costs apply equally to all distribution authorities but, in regard to cost of energy, bulk supplies may be purchased under the provisions of either Sections 7, 11 or 13 of the 1926 Act, the first and last applying where the authority owns a selected station and the remaining one where supplies are obtained direct from the grid. For all practical purposes only Sections 11 and 13 need be considered.

The owner of a selected station has to meet the fixed charges of the station or, where energy is exported to the grid, of a hypothetical station supplying his requirements, and therefore this charge is unaffected by seasonal or year-to-year fluctuations in the system maximum demand. The charges will increase in a series of steps spread over a period of years as additional plant is required to meet the distributor's needs, either in fact or hypothetically. In addition there are the running charges, which are actual costs except for fuel which is averaged for the area in which the station is situated.

Where the distributor does not own a station the fixed charge consists of a predetermined charge per kW of maximum-demand taken over the four winter months, plus a running charge of a predetermined amount per kWh subject to adjustment for the price of fuel. These charges are so computed as to cover, over a period of years, the capital and management charges of the Central Electricity Board, which are thus carried by the consumers supplied by distribution authorities without a generating station.

The differences in the method of arriving at the cost to distributors may be summarised by stating that in the first instance the cost of energy per kWh is not affected by year-to-year fluctuations in m.d. and can be predicted within a narrow margin. In the second case the cost per kWh is materially affected by variation in either m.d. or load factor, and cannot therefore be predicted with any accuracy. So long as nearly 50 per cent. of the costs of distributors are determined by such widely differing methods, there can be no uniformity in tariffs.

To illustrate the extent to which cost of energy and capital charges (which together absorb nearly 80 per cent. of the revenue) are affected by the type of load supplied, the relevant statistics of two types of undertakings have been taken. In one type the output for lighting and domestic uses and in the other the output for power constitutes 70 per cent. or more of the total. The aggregate figures in each case have been treated as applying to single undertakings.

The resulting figures (Table II) show, as might be expected, that the power group sells nearly twice the number of kWh per £1

TABLE II

| Analysis of Costs and Revenue. | Over 70 per cent. of output for lighting and domestic. | Over 70 per cent. of output for power. |
|---|---|---|
| *GOVERNING FACTORS* | | |
| kWh sold per £1 of distribution capita | 53·5 | 99·7 |
| kWh sold per consumer—all supplies | 1,479 | 3,282 |
| Load factor | 32 per cent. | 41 per cent. |
| kWh sold per consumer for lighting and domestic | 1,284 | 619 |
| kWh sold per consumer for power | 184 | 2,504 |
| *COSTS* | | |
| Distribution cost per consumer | 12s. 1d. | 14s. 6d. |
| Management cost per consumer | 16s. 5d. | 13s. 4d. |
| Capital charges per consumer | £2 9s. 6d. | £3 2s. 3d. |
| Capital charges per kWh sold | 0·40d. | 0·22d. |
| Average maximum demand per consumer | 0·71 kW | 1·07 kW |
| Cost of maximum demand per consumer at £3 per kW | £2 2s. 7d. | £3 4s. 2d. |
| Cost of energy per kWh sold | 0·652d. | 0·411d. |
| *REVENUES* | | |
| Per kWh sold for lighting and domestic | 1·31d. | 1·796d. |
| Per kWh sold for power | 0·92d. | 0·56d. |
| Per kWh sold for all supplies | 1·38d. | 0·808d. |
| Per consumer | £8 5s. 0d. | £11 0s. 0d. |

of distribution capital, purchases energy at less than two-thirds of the cost per kWh and obtains an average revenue per consumer that is one-third greater.

So long as the present system of grid charges to distributing authorities is retained, unification and simplification of types of tariffs are rendered difficult. Financial stability of distributors and sales promotional effect can be secured by reducing the number of types of tariffs to three, *viz.*, industrial, commercial and domestic, and the appropriate tariff applied for all energy used irrespective of its purpose.

In the average type of undertaking the class of industrial user consists of a small number of large consumers, the maximum demand and the consumption of the group being of sufficient magnitude to affect materially the cost of energy per kWh to the distributor; the tariff should, therefore, be similar to that upon which the undertaking itself is charged. The only practicable tariff fulfilling these requirements in almost every respect is one consisting of a fixed charge per kVA of maximum demand and a kWh charge subject to a fuel clause. When consumers can offer special conditions such as high load factor or off-peak use, special tariffs are justifiable and necessary.

Generally the consumers in commercial premises constitute a small percentage of the total. The maximum demand of the group is probably coincidental with that of the system, and the encouragement of off-peak use is an essential feature of the tariff applied. A two-rate tariff is suggested, consisting of a flat-rate lighting charge for all kWh used within the system peak periods and round about 0·5d. outside those periods.

Domestic consumers invariably comprise a large number of small users and, where the industrial users are few and small, almost the whole of the costs must be borne by consumers in this class.

TABLE III

| Lighting and domestic consumers | Average for country | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|---|
| Percentage of kWh to total sold .. | 38 | 88 | 91 | 88 | 91 | 87 | 85 | 79·6 | 86·5 |
| kWh per consumer .. .. | 785 | 1,639 | 1,573 | 1,545 | 1,100 | 1,080 | 1,053 | 1,455 | 1,276 |
| kWh sold per £1 distribution capital | 65 | 47 | 62 | 43 | 44 | 43 | 50 | 56 | 46 |
| Average revenue, pence per kWh.. | 1·69 | 1·21 | 1·12 | 1·20 | 1·61 | 1·42 | 1·56 | 1·04 | 1·34 |

For the undertakings A to H, in Table III, the industrial load is almost non-existent. In every case the average revenue per kWh obtained for lighting and domestic supplies is below the average for the country, while the kWh sold per consumer is much higher—irrefutable evidence that the domestic load can be developed without subsidies from other types of load.

Since distribution and management constitute consumers' costs, and together with capital charges can be predicted within narrow limits, the service charge for this group would be arrived at by dividing distribution and management costs equally among all consumers in the group. Capital charges would be divided among the groups *pro rata* to the maximum demand of each group, the portion charged to domestic consumers being apportioned equally amongst the consumers in the group.

In order to secure simplicity and sales promotion, the service charge computed in the manner described above would be collected through a block-rate tariff. The first block would be charged at a flat-rate lighting tariff of sufficient size to recover the service charge and the second block at the running charge of the existing domestic two-part tariff. Wherever possible there should be a third block with the lowest possible running charge available during the summer months for consumers making use of electricity for any two of the following:—Cooking, water heating, space heating.

During a discussion of Mr. Pickles' paper on "Rural Electrification,"* I quoted the following figures that show the preponderance of domestic consumption in rural areas. The kWh sold for domestic purposes expressed as a percentage of the total sold for all purposes were:—Bedford, 90; Kirkcudbright, 86; Wolverhampton, 84; Dumfriesshire, 86; Norwich, 85. The domestic tariff is here the most appropriate. Where extensive use of electricity is made for milk processing, poultry breeding, etc., then the industrial tariff becomes applicable.

In regard to distribution efficiency, during a search spread over many years, I have been unable to find any yardstick with which to compare the costs and selling prices of undertakings. Many factors have to be taken into consideration before an opinion can be formed, some of which are unpublished either in the Commissioners' Returns or in the annual accounts of the individual undertakings. It is questionable whether the costing systems in vogue in many undertakings allow proper analyses to be made. Until there is a uniform system of cost accountancy throughout the industry, assessment of the efficiency of a distribution authority is exceedingly difficult.

* *I.E.E. Journal*, April, 1938.

# Women Shipbuilders

## *Undertaking Craftsmen's Duties*

THE main purpose of a booklet "Women in Shipbuilding" issued by the Ministry of Labour and National Service is to give some concrete examples of what is considered "good dilution," showing that, with suitable training and encouragement, women are able to undertake many of the duties of craftsmen. In some districts there is already a shortage of female labour and consequently it is essential that women should be employed on work for which they have a special aptitude (rather than that where they are merely inefficient substitutes for men), particularly where their natural deftness and neatness are given full scope.

**Trained women are able to undertake skilled work on switchboards. They follow out electric circuits and mount and connect up components**

Tasks in which women excel include welding, electrical work—especially wiring—and painting, and the booklet contains a number of photographs showing women performing work of this kind. In one, a former office worker is seen wiring a cargo vessel, and in others skilled women are mounting and connecting up components on a switchboard. Among the many examples of women employed in welding which are illustrated are the welding of a warship superstructure and fabricating an electric generator seating. Some of the jobs which women are doing successfully are listed

**This former office worker, after taking a course at a Government Training Centre, is now wiring up a cargo vessel**

for the different shops, with an indication of those on which they are as yet not commonly employed in the majority of yards and which, therefore, offer a considerable field for further dilution. In the case of the electrical shops these include the following: armature winders, stud-fusing machine operators, centre lathe turners, millers, fitters and assemblers and wiremen (wiring main control panels, etc.).

Brass studs are fused on to the ship's bulkheads to avoid drilling and tapping, with consequent weakening and loss of water-tightness. The current for this purpose—175 to 250 A for one second per stud, at 110 V—is obtained from a motor-generator. A good operator can work at the rate of 120 studs per hour for short periods, or 500 in an 8-hr. day. Women are doing this work in a naval yard in the London and South Eastern Region after only one day's tuition.

In a section dealing with training, it is stated that Government Training Centres have dealt with a comparatively small number of women for employment in shipbuilding and ship-repairing yards and many more could be trained. Details are given of the syllabus for the fitters' and turners', electric wiring and electric welding courses. Other chapters deal with safety measures and welfare and personnel management."

# CORRESPONDENCE

*Letters should bear the writers' names and addresses, not necessarily for publication. Responsibility cannot be accepted for correspondents' opinions.*

## Electrical Equipment Control

THERE appears to be considerable ignorance in trade circles of the fact that under the Control of Industrial Electrical Equipment (No. 1) Order, 1943, it is an offence to acquire any class of AC generator up to 1,000 kVA or DC up to 1,000 kW, even though second-hand, without the authority of a licence granted by the Machine Tool Control, Ministry of Supply.

Dealings in used motors up to 100 HP are permitted under the Order without licences, subject to certain restrictions, but this is by virtue of motors being named in the second schedule of the Order. Generators are not included in this second schedule.

As an instance of how widely the Order affects trading, I would mention a recent experience. I purchased by auction an old 2-kVA, 60-cycle alternator of American manufacture, but in order to comply with the law, I had to obtain a purchase licence before I was able to take delivery of the machine.

*London, N.*1. W. E. L.

[The Order to which our correspondent refers was summarised in our issue of April 16th last (p. 516).—*Eds., Electrical Review.*]

## Questions Which Must be Answered

THE leading article in your issue of June 18th hits the nail right on the head. I spent 30 years abroad, from 1900 to 1931, selling electrical plant and apparatus manufactured in England. I have seen large steel works established in Canada, later to be followed by Australia, then India, and finally South Africa. Both Canada and Australia are to-day producing large quantities of electrical plant. India has large textile plants, as Lancashire knows only too well.

It is probable that after the war there will be a boom in exporting heavy engineering manufactures to non-British countries, but eventually our exports of these products will gradually decrease, due to industrial expansion in overseas countries.

The answer is a greater production of foodstuffs in this country, which is in line with the strong agricultural policy at present being advocated. In other words, we shall import less and export less.

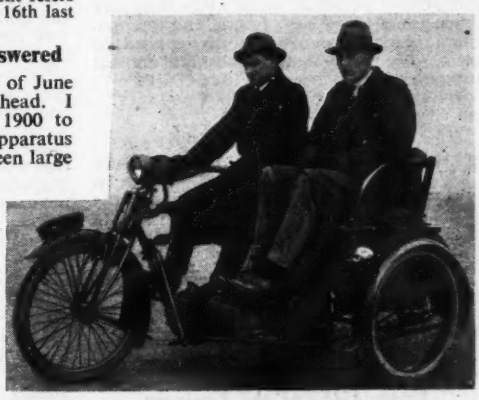
On the other hand, the Dominions must also adjust their economy to suit. They also will produce more manufactured goods themselves and export less foodstuffs. Their surplus food, over their present consumption, will be required to feed the increase in population by immigration which it is hoped will take place.

*Northwood, Middx.* A. S. HERBERT, M.I.E.E.

## Battery-Propelled Bicycles

IN your issue of June 4th you give an account of a battery-propelled bicycle which presents many ingenious features and recalls to my mind my own efforts in that direction about 1917. I was then consultant to Messrs. Ransomes, Sims and Jefferies and intimately associated with them in the development of the Orwell electric vehicle and runabout cranes. A chance conversation with an old friend connected with the motor cycle industry led me to investigate the problem of designing and building an electrically-propelled bicycle. The results achieved are shown in the enclosed photograph.

The frame of the machine, a Rudge-Whitworth bicycle with side-car, was stripped of all the components pertaining to the internal combustion engine drive. I made a motor rated at ¼ HP which fitted exactly in the space occupied by the crank case of the petrol engine. Incidentally, I believe the body of this motor with its odd shape of flanges was the first electrically welded frame made in England. The side-car body was replaced by a square box accommodating the battery which, covered by a



**A motor cycle and side-car adapted for electrical operation by Mr. Mossay in 1917**

C†

lid, made a comfortable and companionable seat for a passenger.

The drive was by means of a vee belt direct from the motor spindle on to the existing vee pulley on the back wheel. The reduction was 5 to 1 and at 18-20 miles per hour on level ground it was a most delightful machine to drive, but the motor and transmission were so silent that at first this caused me such trouble in avoiding running down people and dogs that I was driven to install a powerful " Klaxon " to warn the traffic.

On good level roads I found that the mileage covered by one charge was about 45 miles. The vehicle was in regular daily operation for many years.

*Norwich.* P. A. MOSSAY.

## Domestic Tariffs

IN his article in your issue of June 11th, Mr. Southall makes the point that the maximum load of the majority of consumers gives no indication of the cost of their supply. With this I am in complete agreement. I also maintain that the maximum load of an undertaking cannot be regarded as a true indication of the cost of its bulk supplies.

Get rid of the maximum demand charge, and supply authorities will be able to give domestic consumers a business-getting two-part tariff without the fear of heavy financial losses. The domestic group will, in all probability, purchase more kWh than any other group in the near future, and the m.d. charge cannot be satisfactorily applied to them. The supply industry must find another basis on which to assess the fixed charge.

*Welwyn Garden City.* B. CROWSLEY.

## Boys' Dangerous Prank

WITH regard to the note under the above heading in your issue of June 11th, it would appear that the conduits in the shelters were not efficiently earthed; if they had been, it would have been impossible for them to be made alive.

There seems to be a great need for the periodical testing of all electrical work in air-raid shelters by the proper instruments which all supply authorities should possess.

*Worcester Park, Surrey.* E. H. WHATTON, A.M.I.E.E., M.Inst.F.

## Economics and the Engineer

THE recent excellent contributions to the *Electrical Review* on matters affecting the policy and future of electricity supply, discussions and papers on economics, and the high standard of editorial comment, is a reminder that the industry is conscious of the important part it has to play in the future.

One indication, however, emphasised in the articles on " Improving Electricity Supply " and subsequent editorials, has been the effort made to justify and defend at length, the position of private enterprise. Perhaps private enterprise realises it will require all the defence it can muster if it is to consolidate its future position against organised public opinion ; unless it " voluntarily " intends to work closer to the principles expected of public ownership.

Recent attempts to interest electricity supply engineers in economics is praiseworthy. Like most technical specialists, engineers must sometimes find it confusing to visualise the bigger economic issues involved. Specialised engineering practice is therefore likely to neglect the wider issues at stake for the sake of an immediate practical project under consideration.

The study of economics without bias, does help one to appreciate the total effect of national policy and economy. The crisis which this war has created in the many phases of our social and industrial life already, has to be understood by the electricity supply industry likewise. Any crisis within the industry should not resolve itself therefore, into a clash or difference of opinion on public control *versus* private enterprise, but a recognition of the condition that electricity supply is just one cog—an important one at that—in the big wheel of national enterprise and survival.

The Lord Advocate for Scotland (Mr. J. S. C. Reid) when moving an amendment to the Hydro-Electric Development (Scotland) Bill quite recently, said that normally, there was no particular public interest for the country as a whole whether a large power user went to one district or another, but in the case particularly of metallurgical undertakings it had been held by the Cooper Committee, and was accepted by many people, that either these undertakings must have hydro-electricity, or they would go outside this country altogether. Therefore they must attract them to this area unless they were going to lose them for Great Britain. Further, very narrow margins in prices were very important to large power users of this kind, and a small difference in price might decide whether a potential customer went to the Highlands of Scotland or to some foreign country.

This is an example of the wider economic issues directly associated with electricity supply. Unless the nation as a whole progresses and succeeds under present-day conditions, sectional interests pursuing an independent policy alone, can hardly hope to continue doing so indefinitely. Electricity supply must in consequence, become a handmaid of national policy which cannot remain *laissez-faire*, even if it is not placed completely under some form of public ownership and control.

Economics like most abstract subjects is fashionable. It is a word so frequently used and applied nowadays that people in all walks of business and social life are coming to

regard it as a mystical kind of patent medicine by which most problems can be solved. Being an abstract subject, unfortunately, economics appears only to deal with matters on which agreement is impossible, and with problems of which the solution must remain unknown. It is more a matter of what people think than what they do, regarding action only as an unimportant outcome of thought, which makes economics a vitally interesting subject.

Does an engineer, on the assumption that a study of economics demands this process of reasoning, want to be bothered, or by the nature of his training, take the subject seriously? Perhaps he draws a sharp distinction between economics and political economy, taking economics to mean the study of facts and their automatic consequences, while political economy is the manipulation of facts to produce desired consequences. The danger seems to rest in having them both mixed together and reproduced bearing some new label like "National Planning."

*Edinburgh.* A. V. CROSS.

# PERSONAL and SOCIAL

## *News of Men and Women of the Industry*

AN announcement, published in the *London Gazette* of June 15th, states that His Majesty the King has ordained that **Mrs. Pamela M. D. Colyer,** grand-daughter of the late Lord Hirst, shall enjoy the same title, rank and precedence as would have been due to her had her father, Mr. Harold Hugh Hirst (who died in 1919) survived Lord Hirst and thereby succeeded to the title. Our readers will recall that Lord Hirst's grandson and heir, who was also named Harold Hugh, was killed in 1941 while on active service with the R.A.F.

At the I.M.E.A. meeting reported in this issue it was announced that the following had been elected to serve on the Council:

**Group A.**—*Local Authority Representatives:* Councillors J. Selwyn-Jones (Newton-le-Willows) and W. H. Hooper (Dewsbury); *Engineer Members:* Messrs. P. M. Maxwell (Batley) and Dawson Thomas (Abertillery). **Group B.**—*Local Authority Representative:* Councillor H. M. Cassells (Barnsley); *Engineer Members:* Messrs. C. W. Salt (Carlisle) and J. D. Spark (Willesden). **Group C.**—*Local Authority Representative:* Alderman Sir Percival Bower (Birmingham); *Engineer Members:* Messrs. H. C. Lamb (Manchester) and G. Morgan (Glasgow).

The Melchett Medal, awarded annually by the Institute of Fuel, is to be presented this year to **Dr. E. S. Grumell,** C.B.E., who for many years has been head of the coal research laboratories of Imperial Chemical Industries, Ltd. The research and experimental work which he has carried out, and which has been published for the benefit of the community as well as of his company, has resulted in improving the design of many combustion appliances and, consequently, in saving large quantities of fuel. Dr. Grumell has also served as chairman of the Fuel Efficiency Committee set up by the Mines Department and later carried on under the Ministry of Fuel and Power. The presentation will take place at the annual conference of the Institute next October.

**Mr. A. E. Tattersall,** M.I.E.E., whose appointment as assistant chief engineer (signals), L.N.E.R., was recently reported, has been responsible for many improvements in railway signalling practice in this country. As signalling and electrical assistant with the Metropolitan Railway, he was in charge of the change-over from mechanical to automatic electrical signalling throughout the electrified area, and subsequently he was associated with the automatic signalling of the East London Railway. After the last war, during which he held a commission in the R.A.O.C., he joined the Great Northern Railway as signal superintendent and in 1924 was appointed assistant signal engineer, Southern Area, L.N.E.R. In the following year he was transferred to York, becoming signal and telegraph engineer, North-Eastern Area, in 1928. He was responsible for the introduction into this country of a number of developments in signal practice, including carrier-wave telephony and modern teleprinters between York and Newcastle. In 1936 he was appointed signal and telegraph engineer, Southern Area, and has since been responsible for the conversion of telegraph trunks to a teleprinter network, with automatic switching, which is believed to be the only one of its kind in the country.

Mr. Tattersall is a Fellow of the Institute of Physics and is the author of "Modern Developments in Railway Signalling" published in 1921.

**Mr. J. Ellson,** assistant general manager of the Leicester City Transport Department, has retired after 48 years' service.

**Mr. J. E. Tanguay,** general manager of the Quebec Power Co. has been appointed vice-president and managing director of the company. **Mr. J. N. Sicard,** general superintendent, succeeds Mr. Tanguay as general manager.

**Miss Phyllis E. Atkinson,** daughter of the late Mr. Ll. B. Atkinson, has been elected a Fellow of the Royal Society of Arts.

## Obituary

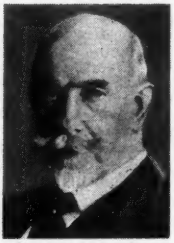
**Mr. A. O. Gibbon.**—The death occurred suddenly from heart failure at Seale, Farnham, on June 19th, of Mr. Andrew Owen Gibbon, M.I.E.E., who was prominent in Post Office engineering circles until his retirement in 1935. He was a member of the formation committee of the Institution of Post Office Electrical Engineers and for some time assistant editor of the Institution's *Journal.* Other positions which he held included that of general secretary of the Society of Post Office Engineers, hon. secretary of the Institution of Professional Civil Servants and chairman of three sub-committees of the British

Standards Institution. He was examiner for the departmental technical certificate from 1926-32, and wrote numerous technical instructions and printed papers.

Mr. Gibbon was born at Llandudno in 1874, and educated at St. John's School, Birkenhead, and Liverpool Technical School. He began his career with the Post Office in 1902 as a sub-engineer at Liverpool, being promoted to second-class engineer in 1908. From 1911 to 1926 he was assistant engineer, Lines and Construction Section, and from 1926 to 1932 executive engineer, Telegraph Section, finally holding the position of assistant staff engineer, Construction Branch, Engineer-in-Chief's Office, G.P.O.

Besides his Post Office associations, Mr. Gibbon was keenly interested in music and was chairman of the Oriana Madrigal Society and of the Whitsuntide Singers and Players founded by Gustav Holst.

**Mr. S. Mavor.**—Further details of the career of Mr. Sam Mavor (whose death was reported in our last issue) have been sent us by his company, Mavor & Coulson, Ltd.



The late Mr. Sam Mavor

Mr. Mavor's first electrical job was the lighting of the square in front of Holyrood Palace, Edinburgh, in 1881, by means of a mobile generating plant with which he afterwards toured the country. When he joined Mavor & Coulson, after serving as an engineer at sea, he supervised the installation of electric light and power in many factories, public buildings and ships.

Seeing a need for specialisation he and his brother Henry spent much time and money upon the development of coal-cutting machines; the first was produced in 1897. Success was eventually achieved and the firm's work had much influence in this country and abroad in the adoption of machine mining, including the use of conveyors and elevators which the firm also developed.

Mr. Mavor took a great interest in the welfare of his employees and he was responsible for the very successful suggestion scheme which has benefited both the company and its workers.

**Mr. W. Peto.**—The death occurred at Bournemouth on June 12th of Mr. William Peto, M.I.E.E., who in 1889 founded the firm of Peto & Radford, which has been responsible for many of the advances in accumulator design from the earliest days down to the present time. In 1919 Peto & Radford amalgamated with Pritchett & Gold & Electrical Power Storage Co., Ltd., of which Mr. Peto was a joint managing director until his retirement in 1933.

Peto & Radford exhibited at every show of the Society of Motor Manufacturers & Traders, beginning with the first at the Crystal Palace in 1897, and Mr. Peto served on various S.M.M.T. Committees, being chairman of the Accessories Committee on more than one occasion. He will be greatly missed by his many friends in the trade with whom he was extremely popular, and older members will recall his ready wit.

Mr. Peto, who was in his seventy-sixth year, leaves a widow and one daughter.

**Mr. H. J. Coates.**—The death occurred on June 3rd of Mr. H. J. Coates, who was apprenticed to the Peel Works of the General Electric Co., Ltd., in 1898, and had been, except for one short interval, with the G.E.C. ever since. When, in 1909, the Switch and Control Gear Department of the Peel Works was moved to Witton he entered the Estimating Department and later became chief estimator for that section. In 1919 he began to act as consulting engineer for the Switchgear Department and worked on schemes for many large and important contracts for switch and control gear where expert knowledge was required. He made many original contributions to the development of 132-kV grid substations and to the layout of all kinds of switchgear installations. He did pioneer work on industrial control gear, particularly for rolling mills, paper making machinery, colliery winders and the like, and also had extensive knowledge and experience in the field of electric ship propulsion. He combined fertility of ideas and ingenuity of invention with such modesty and self effacement that probably only those who knew his work intimately realised fully its value and significance.

**Mr. J. J. Richards,** whose death is reported, was formerly lighting, heating and power engineer at the G.P.O. Engineering Department, Preston.

**Mr. W. J. Woodward,** of Woodward & Bros., Ltd., electrical and general engineers, Stratford, has died at the age of seventy-seven.

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**Wills.—Mr. A. L. Forster,** late director of Chance Bros. & Co., Ltd., and the associated company, Glass Fibres, Ltd., and of Austinlite, Ltd., left personal estate of £30,262.

**Mr. F. A. B. Lord,** chairman of W. F. Dennis & Co., Ltd., left £67,389, with net personalty £59,650.

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## Metal Bonding

A METHOD of bonding, with the aid of synthetic resin adhesives, light alloys and steel with a strength exceeding that of riveting as well as of firmly jointing metal to wood without undue stress concentration is announced by Aero Research Ltd., Duxford, Cambridge.

Application of this " Redux " process involves accurate control of variables, but it is adaptable to the nature of the surfaces to be united and the character of the structure to be assembled, being unaffected by water, oil or petrol. The method works best with trivalent metals, such as aluminium (dural) and chromium, or iron and steel; it is less satisfactory with brass, tin or zinc. The resin bond is mildly thermoplastic, losing some of its strength at temperatures above 212 deg. F., which is however regained on subsequent cooling provided that the joint is not meanwhile subjected to undue strain.

This new method avoids the troublesome problem of attaching steel fittings to the root ends of wooden spars and is a useful means of local reinforcement for wood that may be subjected to concentrated loads, while " Redux " joints do not become brittle at temperatures below freezing point. The process is understood to have been declared secret by the Government, but there are facilities at the company's works for bonding in this manner for essential war work, or approved firms may obtain licences to operate the process.

# Spain's Electrical Imports

## *Statistics for First Half of* 1942

THE Spanish authorities have resumed the issue of statistics of the country's foreign trade. Those for the first half of 1942 are the latest to reach this country, and from them the figures of imports of the principal electrical goods have been extracted and are given in the accompanying tables, which show also the principal countries of origin. Comparative statistics, by countries, for the first half of 1941 are not available, but in order to afford a rough comparison of the trend of trade the corresponding figures for the full twelve months of 1941 are given.

As a whole imports of electrical material into Spain since 1940 have shown a steady advance, as follows:—1940, Pes. 8,701,000; 1941, Pes. 11,077,000; first half of 1942, Pes. 5,945,000. The most notable increase was shown in the meters and electro-medical apparatus group, in which Germany retained the lead, while there were increases, too, in heaters, cookers, dry batteries, cables and radio valves. In the power plant group there were decreases nearly all round. Great Britain's chief participation was in the cable trade. The rate of exchange for the peseta may be taken as 45 to the £.

Spanish trade with Great Britain is based on half-yearly agreement which covers exports as well as imports and in which the United States is a partner. The arrangement takes into account the essential condition that goods received by Spain shall not be re-exported to the enemy nor the equivalent re-exported. At the same time, if it is found that the enemy is buying materials that are of use in its war effort the United Kingdom Commercial Corporation or its United States prototype undertakes pre-emptive buying. In conformity with this course, wolfram has been acquired, which the Germans had been after. They have also been buying Spanish mica which, however, is not of good quality.

**Table I.—Goods and Apparatus.**

| Description of Goods and Countries of Origin | Jan.–Dec., 1941 (Thousand Pesetas) | Jan.–June, 1942 (Thousand Pesetas) |
|---|---|---|
| *Electric meters, voltmeters, ammeters, and electro-medical apparatus—* | | |
| Total | 375 | 744 |
| From Germany | 133 | 595 |
| „ France | 72 | 19 |
| „ Switzerland | 88 | 102 |
| „ Italy | 16 | 12 |
| *Switchboards—* | | |
| Total | 143 | 40 |
| From Germany | 16 | 6 |
| „ United States | 83 | 2 |
| „ Britain | 1 | 2 |
| „ Italy | 37 | 7 |
| „ Switzerland | — | 19 |
| *Switches, circuit-breakers, lampholders, etc., up to 1,000 grammes—* | | |
| Total | 282 | 145 |
| From Germany | 87 | 103 |
| „ Britain | — | 8 |
| „ United States | 64 | 5 |
| „ Holland | 6 | 10 |
| „ Belgium | 67 | 9 |
| *Ditto, 1 to 100 kg.—* | | |
| Total | 757 | 285 |
| From Germany | 315 | 191 |
| „ Switzerland | 296 | 53 |
| „ Italy | 8 | 11 |
| „ Belgium | 10 | 13 |
| *Ditto, 100 kg. and over—* | | |
| Total | 760 | 134 |
| From Germany | 348 | 42 |
| „ Switzerland | 491 | 57 |
| *Telegraph and telephone apparatus—* | | |
| Total | 1,300 | 912 |
| From Germany | 176 | 296 |
| „ Holland | 88 | 185 |
| „ United States | 349 | 52 |
| „ Britain | 3 | 54 |
| „ France | 137 | 99 |
| „ Italy | 163 | 63 |
| „ Sweden | 91 | 72 |
| *Wireless valves—* | | |
| Total | 348 | 253 |
| From Germany | 128 | 198 |
| „ Holland | 43 | 7 |
| „ Hungary | 1 | 15 |
| „ United States | 114 | 8 |
| *Cables over 1 cm. diam.—* | | |
| Total | 109 | 315 |
| From Germany | 18 | 7 |
| „ Britain | 17 | 302 |
| *Cables not exceeding 1 cm. diam.—* | | |
| Total | 31 | 37 |
| From Germany | 17 | 6 |
| „ Britain | 1 | 11 |
| *Insulated wire and cable less than 0·5 mm.—* | | |
| Total | 8 | 29 |
| From Germany | 4 | 5 |
| „ Britain | — | 19 |
| *Lamps, complete—* | | |
| Total | 328 | 237 |
| From Germany | 170 | 181 |
| „ Holland | — | 1 |
| „ Britain | — | 8 |
| „ Hungary | 28 | 29 |
| „ Italy | 63 | 12 |
| *Mercury vapour lamps—* | | |
| Total | 298 | 164 |
| From Germany | 48 | 59 |
| „ Holland | 117 | 81 |
| *Heaters, cookers, hot-plates, etc.—* | | |
| Total | 28 | 80 |
| From Germany | 13 | 77 |
| *Accumulators—* | | |
| Total | 57 | 8 |
| From Germany | 5 | 3 |
| *Dry batteries—* | | |
| Total | 13 | 84 |
| From Germany | 11 | 38 |
| „ Denmark | — | 46 |

### Production of Equipment

*Reuter's Trade Service* reports that according to the official German news agency Spain at the present day has its own electrical industry, whereas before the civil war nearly all electrical equipment used in the country had to be imported.

At present the industry numbers 544 undertakings with a total capital of 375 million

pesetas (£8,330,000), and in 1942 goods to the value of 503 million pesetas (£11,000,000) were produced. Now all kinds of motors and transformers can be manufactured in Spain. Last year motors of up to 1,040 HP and transformers of up to 20,000 kW were produced. In 1942 the production of electric lamps amounted to 26·3 million compared with 21·5 million in 1935, and it is hoped to reach the figure of 40 million. Radio apparatus is produced by 170 of the firms, and in 1942 45,000 radio sets, valued at 90 million pesetas, were manufactured.

**Table II.—Electrical Machinery.**

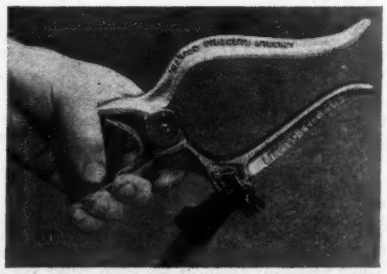
| Description of Machinery and Countries of Origin | Jan.–Dec., 1941 (Thousand Pesetas) | Jan.–June, 1942 (Thousand Pesetas) |
|---|---|---|
| *Dynamos, motors, fans, alternators, transformers, starters, rheostats, and parts up to 5 kg.—* | | |
| Total | 405 | 274 |
| From Germany | 165 | 178 |
| „ France | 33 | 11 |
| „ Switzerland | 32 | 19 |
| „ Britain | 40 | 32 |
| „ United States | 83 | 4 |
| „ Italy | 46 | 20 |
| *Ditto, from 5 to 25 kg.—* | | |
| Total | 650 | 286 |
| From Germany | 125 | 76 |
| „ France | 5 | 10 |
| „ Holland | 310 | 83 |
| „ Switzerland | 89 | 83 |
| „ Britain | 11 | 5 |
| „ United States | 46 | 4 |
| „ Italy | 14 | 22 |
| *Ditto, from 25 to 100 kg.—* | | |
| Total | 385 | 181 |
| From Germany | 77 | 96 |
| „ Denmark | 1 | 7 |
| „ Switzerland | 205 | 59 |
| „ Italy | 29 | 8 |
| „ United States | 43 | 4 |
| *Ditto, from 100 to 500 kg.—* | | |
| Total | 548 | 231 |
| From Germany | 49 | 68 |
| „ France | 2 | 9 |
| „ Switzerland | 394 | 121 |
| „ Britain | 20 | 4 |
| „ United States | 42 | 3 |
| „ Sweden | 11 | 12 |
| *Ditto, from 500 to 1,000 kg.—* | | |
| Total | 326 | 116 |
| From Germany | 208 | 73 |
| „ Switzerland | 84 | 34 |
| *Ditto, from 1,000 to 3,000 kg.—* | | |
| Total | 589 | 104 |
| From Germany | 164 | 44 |
| „ Switzerland | 341 | 38 |
| „ Sweden | 7 | 5 |
| „ United States | 58 | 9 |
| *Ditto, from 3,000 to 5,000 kg.—* | | |
| Total | 515 | 652 |
| From Germany | 15 | 8 |
| „ Switzerland | 478 | 644 |
| *Ditto, over 5,000 kg.—* | | |
| Total | 1,876 | 163 |
| From Germany | 30 | 79 |
| „ Switzerland | 1,696 | 35 |
| „ Sweden | — | 40 |
| „ Britain | 149 | 9 |
| *Generating sets and rotary convertors up to 1,000 kg.—* | | |
| Total | 94 | 47 |
| From Germany | 9 | 6 |
| „ Sweden | 22 | 17 |
| „ United States | 12 | 9 |
| „ Switzerland | 44 | 15 |
| *Ditto, from 1,000 to 5,000 kg.—* | | |
| Total | 27 | 79 |
| From Switzerland | 27 | 65 |
| „ Sweden | — | 11 |
| *Ditto, over 5,000 kg.—* | | |
| Total (all from France in 1942) | 42 | 92 |

# Welding Clamp

LONG service is an important item these days when considering cable for electric arc welding. Clean connections to the machine and good earthing are essential, since they lengthen the life of the cable by avoiding "shorting", and save consumption by ensuring a steady arc for easy welding. It is important that the cable used shall be the correct size, for overloading will not only cause fluctuation of the current at the arc and make welding difficult, but overheating the cable will also damage its insulation.

To economise, short lengths of cable may be joined with jack and plug type connectors which are easily attached; they lock into position and cannot be accidentally pulled apart or work loose. Complete insulation is afforded by fibre sleeves and much more use could be made of this type of connection, particularly in shipyards and other outside work, where connections must be adequately insulated against damp.

Cable connections to the actual job can be made less haphazard and makeshift by the use of the earthing clamp illustrated, which is manufactured by the Lincoln Electric Co., Ltd., of Welwyn Garden City. It is specially designed for quick action with a longer upper lip so that it may be jammed into place instantly. The wearing qualities of this phosphor-bronze clamp are increased by the strong spring action, insulated with fibre washers, and the fact that



**Earthing clamp for welding cable**

the spring may be replaced when worn. There is no screw to be affected by spatter, and large currents can be carried safely.

# COMMERCE and INDUSTRY

## *Power Factor Correction.* *Views on Mica Control.*

### Chief Engineers' Salaries

At the request of Cardiff City Council, Alderman W. Walker (Manchester) recently addressed the Council on the subject of the 1941 agreement on chief engineers' salaries, and advocated its adoption to remove the extraordinary state of chaos which existed prior to the agreement. On the same day Alderman Walker addressed a gathering of local authority representatives from the South Wales area on the subject.

Stockton-on-Tees Town Council has declined to put into operation the agreement of the National Joint Committee of Local Authorities and Chief Electrical Engineers regarding salaries. The Associated Municipal Electrical Engineers have pressed the Council to change its attitude, but without success.

### Contract Price Adjustment Formulæ

The British Electrical and Allied Manufacturer's Association notifies us of the latest figures for use in its contract price adjustment formulæ. They are as follows and represent no change from the figures for the two previous months :—

(a) " Rates of Pay."—The rate of pay for adult male labour at June 12th shall be deemed to be 86s. 6d. ;

(b) " Costs of Material."—The index figure for Intermediate products last published by the Board of Trade on June 12th is 170·9 and is the figure for the month of May, 1943.

### Scottish Fuel Conference

The Scottish Regional Fuel Efficiency and Economy Committee of the Ministry of Fuel and Power, is arranging a conference at Glasgow University on Thursday and Friday, July 8th and 9th, which will be opened by the Minister of Fuel and Power. The object of the conference will be to promote the exchange of information between different industries, and the main items for discussion will be steam utilisation, feed water treatment and furnaces.

Tickets for the Conference can be obtained from Mr. J. Edward, the secretary, 425, Sauchiehall Street, Glasgow, C.2. Applications should be made immediately.

### Electrical Equipment Control

Some notes on the Control of Industrial Electrical Equipment (No. 1) Order, 1943 (see *Electrical Review*, April 16th, p. 516) have been circulated to electricity supply undertakings by the Electricity Commissioners. In these it is pointed out that the Order does not apply to the acquisition of the specified equipment by authorised electricity undertakers with the approval of the Commissioners. Such approval would be regarded as having been given if in respect of the proposed equipment the undertaker has received from the Commissioners an authorisation for steel, an authorisation under Regulation 56A of the Defence (General) Regulations, a loan sanction, or a consent under Section 43 of and the Fifth Schedule to the Electricity (Supply) Act, 1926.

With regard to static condensers for power factor correction, the Commissioners have been informed by the Director of Industrial Electrical Equipment that a considerable number of applications is being received from electricity consumers for licences to authorise them to acquire such condensers and that in a substantial proportion of the cases the consumers have indicated that the electricity undertakers concerned have insisted on the installation of such equipment before they will connect up a new supply where the power factor is low, more particularly in the case of supplies for welding plant equipment and fluorescent lighting installations.

In view, however, of the very great shortage of the materials required for the manufacture of condensers the Commissioners consider it necessary to ask undertakers, as a purely war-time measure, not to ask their consumers to install such equipment unless the undertakers are in a position to satisfy the Commissioners that if condensers are not installed their systems would be prejudicially affected and they would be involved in the provision of other equipment or additional mains which would alternatively use more materials than would be required to provide the condensers.

### American Mica Mission

Members of the Mica Mission from the United States were entertained to luncheon at the Savoy Hotel, London, last week by the Mica Trade Association. The company numbered over seventy and included representatives of all the leading firms concerned with the mica trade as distributors and processors.

In proposing the toast of " The Guests " the chairman, Mr. D. Bruce Scott, said he understood that the main purpose for which Mr. W. J. Given and his colleagues had come to this country was to study the uses of mica here. In mica the United Nations were more fortunate than in the case of some raw materials as we had access to the main sources of supply, but these supplies must be conserved and put to the best use. How much we or America had was immaterial so long as it was directed to where it could best be used for the war effort. Referring to the question of control, Mr. Scott said that this had put some of their members out of business, but they accepted it as part of the price of victory. Controls in themselves, however, were the negation of liberty, and one of the things that the Association would do when the war was won was to fight strongly for the quickest possible removal of the barriers which restricted trade and private enterprise. He considered that Mr. Herbert Morrison's remark that there was " a devil of a row over controls coming after the war " was a gross understatement.

Mr. Given, chairman of the American delegation, responding, said that they had come as students. Britain had been in the front line for four years and had stored up great lessons

on how to get along on really short rations, and they from America had come to learn those lessons.

Proposing "The Mica Trade and Industry," Mr. G. F. A. Burgess, the Mica Controller, said the fact that he had little or no connection with mica before he became Controller a few weeks ago enabled him to view the future rather more independently than some of them. It was apparent that the enormous scientific advances made in this country during the war were going to produce a permanently improved standard of living throughout the world. In view of that, what major industry was likely to benefit, with others? Clearly it was the electrical and radio industry, which concerned mica.

The toast was responded to by Sir Geoffrey Winterbotham, who also proposed the health of the chairman.

## Works Lighting

Improved illumination has been provided at the works of the Fischer Bearing Co., Ltd., by a B.T.H. installation. In the view room assembly, "Mazda" lamps in "Mazdalux" dispersive reflectors are spaced at intervals of 12 ft. by 12 ft., one 200-W lamp being in each 12 ft. square. This gives satisfactory diffusion and at the same time a highly efficient illumination at the bench level, the average intensity being 13 ft.-candles. Mounting height in this department is 12 ft. from the floor. In another section, with similar spacing and a mounting height of 14 ft., the average intensity obtained is 20 ft.-candles, the lamps here being of 500 W.

## Examining Breath by Electricity

The discovery by Dr. G. R. Wait (Carnegie Institute, Washington), of electrically charged particles in exhaled breath, has led to the construction of apparatus for collecting and counting such particles. Although in the earliest stages of experiment, it seems apparent that the apparatus may help in diagnosing disease-causing micro-organisms. Such nuclei, or ions, were first counted by John Aitkin of Falkirk, Scotland.

Photographic counting recorder of electrified particles in air

The Carnegie Institute counting device consists of three concentric brass cylinders, their dimensions and arrangement being small, intermediate and large. The outer cylinder is earthed and insulated with bakelite from the intermediate cylinder and with amber from the inner cylinder. A battery is used to maintain a difference of potential of 500 to 1,000 V across the outer and intermediate cylinders. A sensitive electric current measuring device is connected across the outer and inner cylinders. The electric field, when air is drawn through between the inner and intermediate cylinders, pulls ions from the airstream to the cylinder that is charged with the opposite sign, which "flow" is determined by means of the current meter. The deflections of the latter are automatically recorded on photographic paper attached to a drum rotated by clockwork.

## A.E.U. Secretaryship

The *Monthly Journal* of the Amalgamated Engineering Union gives the names of eight members who have been nominated for election as general secretary of the Union. The position was rendered vacant by the death of Mr. F. A. Smith in January last. Mr. J. Tanner, president of the Union, is acting as secretary until the new appointment is made. The ballot ends on August 16th.

## Research in India

The Maharaja of Mysore recently visited the Indian Institute of Science where he was received by Dr. J. C. Ghosh, the director. His Highness was shown round the Department of Physics, where he was interested in progress made in researches on fluorescence, light-scattering and X-rays. The new Department of Aeronautical Engineering and the Department of Electrical Technology and Communication Engineering were also visited.

## Berger Group Extended

The wide interests of the Berger group of companies has been enlarged by the inclusion of Berger Plastics Developments, Ltd. The directors are Messrs. W. J. Darby, L. E. Wakeford, F. Macmanners and C. G. Fry.

## Death at Power Station

At an inquest at Pontefract last week on Harold Cripwell (23), labourer, who died from burns and shock sustained at the Ferrybridge power station of the Yorkshire Electric Power Co., the coroner (Mr. W. Bentley) said that the accident had clearly happened because of a breach of regulations. The regulation was that this kind of work must not be carried out without a work permit card, and if there had been any practice of doing work on verbal instructions it ought to cease forthwith.

Mr. John H. Freeman, station electrician, said that when his gang of six men had completed some cleaning of high-voltage gear, as specified on the work permit which had been issued to him, the charge engineer, Mr. Robinson, came to them to make "dead" further apparatus on which they could work. After he had apparently done

so he informed witness that all was ready, and witness set deceased and another man to put up a ladder to the pillar carrying the o.c.b. isolator. While witness was helping two other men with a longer ladder, there was a terrific flash and bang, and the next thing he remembered was that he was 30 or 40 yards away. He declared that it was a regulation that if an authorised officer was in attendance he took charge, and contended that if he were given verbal instructions by the charge engineer he was entitled to act on them without any permit card. In answer to Mr. J. W. Chant, secretary of the company, he admitted that he could not point out any printed regulation to this effect.

Mr. Joseph Edgar Robinson, charge engineer, said he gave Mr. Freeman no instructions at all, but told him he would make some changes so that he could go on with some work, but he did not detail this work. He was not aware of any practice of work being done on verbal instructions from any engineer present on the job. The voltage on this apparatus was 66,000.

A verdict of "Death from misadventure" was returned.

## Wash Boiler Fatality

At an inquest at South Shields on Mrs. Irene Jary, aged thirty-seven, who received a fatal electric shock from a wash boiler, an electrical installation inspector employed by the Corporation Electricity Department who examined the boiler said that the plug was broken and there were loose wires. Mrs. Jary would have had to juggle with the wires from time to time. To change the plug would have taken a skilled man about five minutes.

Mr. A. Jary said that his wife had reported a defective plug on more than one occasion to the North Eastern Housing Association, which owned the house, but was told that there were no maintenance men available.

## Overseas Standards

The following overseas standards have recently been received at the offices of the British Standards Institution, 28, Victoria Street, London, S.W.1, where they may be inspected or obtained on loan:—New Zealand.—NZSS. E/83. Hearing aid equipment. Canada.—CESA. C83. Additional drawings to pole line hardware. Switzerland.—VSM. 23861. Cables: lead.

From the United States the following have been received:—Amendments to Federal Specifications.—WF. 831. Fuses: plug, non-renewable. WL. 131. 1942 supplement, amendment No. 1 lamp auxiliaries, fluorescent. WF. 791a. Fuses: cartridges, inclosed, non-renewable. Amendments to Alternate Federal Specifications. —EWC. 421a. Cleaners, vacuum, electric, portable. EWC 471a. Clock systems, electric.

## Vulcanised Fibre Distribution

The qualification for membership of the Vulcanised Fibre and Leatheroid Association, Ltd., formed to distribute such supplies of these materials as may be released from time to time by the Ministry of Supply has been amended to read as follows:—

The term "member" is defined as a person, firm or company who or which imported a minimum of 30 tons of vulcanised fibre and/or leatheroid during the calendar years 1937, 1938 and 1939 and continued to trade in these materials during the years 1940, 1941 and 1942. Any person, firm or company (not already a member of the Association) having these qualifications and desiring to become a member should apply to Fitzhugh Tillett & Co., chartered accountants, Abbey House, Baker Street, N.W.1, by not later than July 31st. Applications should be accompanied by records of tonnage imported in each of the years specified above.

## Protecting Magnesium

Magnesium is the most electropositive of the useful metals, being therefore unusually susceptible to corrosive attack. Protective films can be formed on the binary magnesium-manganese alloy known as AM503, but not on metallic magnesium or the aluminium-containing A8 alloy, by electrolytic treatment in a hot solution of dilute chromic acid with AC on which sufficient DC is superimposed to render the mean value of the applied EMF negative. Films produced with unidirectional current treatment are, by comparison, non-protective, while the electrolytic method is more speedy and otherwise superior to the most effective of the commercial chromating tip processes. Theoretical explanations of the different experimental results obtained with AC and DC and of the divergence between the performances of the respective alloys are advanced by Mr. N. Parkinson and Dr. J. W. Cuthbertson (Magnesium Elektron, Ltd.) in a paper contributed to the Institute of Metals.

## Cutting Lubricant

A useful compound which is sold under the trade name of "Trefolex" is intended to serve as a lubricant for all kinds of hand-operated cutting tools, such as taps and dies, reamers, hacksaws, etc. It is made by the Pearl Varnish Co., Ltd., Treforest Trading Estate, Pontypridd, South Wales, in the form of a paste that is smeared on the metal to be cut, or the tool, before commencing work.

The paste melts as frictional heat is generated, so continuously lubricating the cutting edge, but liquefying more slowly than oil because of the colloidal content of the compound, thus lessening the cutting effort needed and preserving the tool edge as well.

# INFORMATION DEPARTMENT

GENERAL inquiries from readers relating to sources of electrical goods, makers' addresses, etc., are replied to by our Information Department through the post. Inquiries should be accompanied by a stamped addressed envelope.

Our extensive records enable us to reply to most queries, but occasionally we ask for our readers' assistance in tracing names and addresses not known to us. We should be glad to have such information regarding the makers of the following:—

"SPEDI-BOIL" immersion heater.
"DOMESCO" vacuum cleaner.
"CLASSIC" immersion heater.
"H. & C." (in design) voltmeters.

Present address of AIRWAY, LTD., makers of vacuum cleaners.

# Dynamic Testing Machines

## *Ascertaining Fatigue Endurance Limits of Materials*

IN addition to the usual static tensile tests it is often desirable to ascertain the limit of fatigue endurance that materials will withstand under the stresses to which they are subjected in service.

Small machines for carrying out fitness trials are marketed by W. & T. Avery, Ltd., Soho Foundry, Birmingham, 40. They include the fatigue tester (figs. 1 and 2) for the reversed-plane bending of flat and round, or tubular specimens. By means of special grips, this

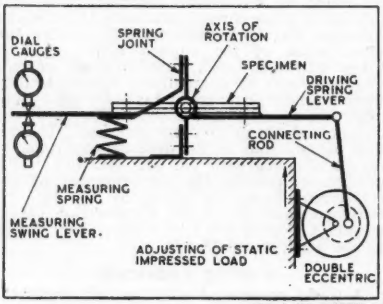



**Fig. 1.—Diagrammatic representation of working principle of fatigue endurance testing machine (fig. 2)**

machine may also be used for the purpose of applying alternating torsional stresses.

Another feature of the apparatus is that, if required, the specimen can be subjected to an initial static load upon which alternating stresses can be superimposed for emulating service conditions and, moreover, the same machine may be utilised advantageously for testing plywood and plastic materials as well as metals.

Its principal parts consist of a driving motor with double eccentric, a connecting rod with a driving swing lever and an oscillating measuring lever with two dial gauges to indicate the amplitude. These parts are supported on a cast-iron housing which also carries the electrical equipment of the machine. It rests upon four small rubber feet to obviate prejudicial oscillations when the machine is required to run without a prepared foundation.

A calibration graph indicates the number of divisions required for setting the machine to the desired amplitude of the oscillating lever. The driving motor can be moved vertically in order to impose upon the specimen under test an initial static load.

The maximum capacity of the machine is 250 in.-lb., which means ± 125 in.-lb. alternating bending stress and ± 250 in.-lb. static load, the speed being about 1,500 stress cycles per minute. A stress counter connected to one of the free

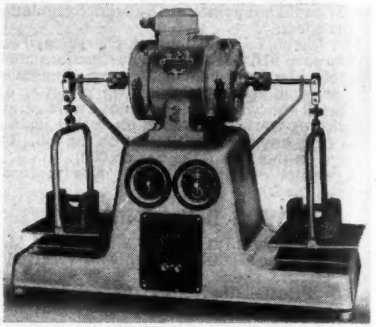
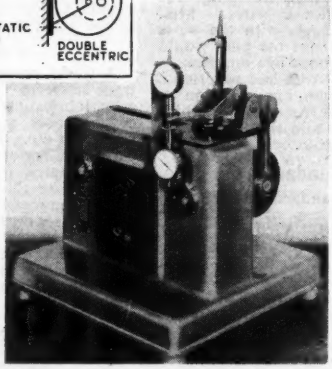


**Fig. 3.—"Duplex" cantilever beam tester for testing two specimens simultaneously.**



ends of the driving motor shaft shows the number of reversals which are produced during the test.

An automatic cut-out switch stops the machine upon fracture of the specimen. Flat specimens varying between $\frac{1}{16}$ in. and $\frac{1}{4}$ in. in thickness can be accommodated.

The "Duplex" revolving cantilever beam testing machine (fig. 3), of simple design, is capable of testing two specimens at a time and the speed of about 3,000 RPM makes it suitable for routine work.

The maximum weight to be added to each load is 45 lb. which, in addition to the weight of 5 lb. of the pan itself, produces a maximum stress of 25 tons per sq. in. upon a specimen with a diameter of 0·3313 in. and of 50 tons per sq. in. upon a specimen with a diameter of 0·2629 in. The minimum stress produced by the pan itself without any added weights is 2½ and 5 tons per sq. in. respectively.

Two stress counters which are provided in the front of the machine housing clearly indicate the number of reversals for each specimen during the test. Fracture of one specimen stops the appropriate counter by means of a cut-out button under the load pan; fracture of the second specimen stops the other counter and also the machine.

# ELECTRICITY SUPPLY

## *Ashton M.P.'s Advice. "Nesco" and the White Paper.*

**Ashton-under-Lyne.**—GAS COMPANY'S OFFER REJECTED.—The Town Council has rejected the offer of the parent company of the Ashton Gas Co. to acquire the Corporation's electricity undertaking. The Corporation Finance Committee had an interview on the subject with Sir William Jowitt, the local Member of Parliament, who stated that the proposal to dispose of the electricity undertaking to private enterprise was not one which he would advise the Council to entertain. The Committee therefore advised the Council that it saw no useful purpose in the continuance of the negotiations with the Ashton Gas Co. The Town Council has accepted this recommendation.

**Douglas (I.O.M.).**—MAINS EXTENSIONS.—The Electricity Committee is to extend mains in Market Street and Back Strand Street at a cost of £122.

**Essex.**—CHANGE-OVER.—The County Health Committee recommends the expenditure of £600 for change-over to public electricity supply at the New Hall, Boreham.

**Fort William.**—DEFINING "LARGER HOUSES."—At the last meeting of the Town Council the convener of the Electricity Committee, in dealing with proposals for the revision of electricity charges, explained that trouble had arisen through the lax wording of the tariff for "larger houses." The term "larger houses," was not defined, with the result that people with low rented houses were taking advantage of this tariff which had never been designed for them. The Committee proposed to limit the tariff to houses with a rental assessment of not less than £37 10s. Consideration of the Committee's recommendations was postponed.

**Hull.**—COST AND QUALITY OF COAL.—In the course of a discussion at a meeting of the Electricity Committee last week it was stated that the price of coal to the Department was 50 per cent. higher than in pre-war times and its lower calorific value entailed an additional cost of £2,300. In reply to a question Mr. D. Bellamy, general manager, said that the lower quality was also responsible for increased boiler repairs. If they did not take the coal they were directed to receive they would not get any at all. He thought that one reason for the poor quality was that mixing at the pit-head was not so good as formerly.

**Inverness.**—PERSONNEL OF HYDRO-ELECTRIC BOARD.—The Town Council has approved the principle of a suggestion by Sir Murdoch MacDonald, M.P. for Inverness, that steps should be taken to elect a representative committee which, among other things, would hold a watching brief in connection with any changes in the personnel of the Board which the Secretary of State is to set up for the hydro-electric development scheme. Northern burghs and county councils are to be invited to appoint representatives to serve on this committee.

**Lichfield.**—H.V. SUPPLY.—The Electricity Committee is to provide a h.v. supply and erect a substation, at a cost of £510.

**London.**—BETHNAL GREEN TARIFF REVISION.—Owing to increasing costs and other circumstances due to the war the Bethnal Green Electricity Department has increased its charges and the new rates will commence after the meter readings for the present month. The secondary charges under the all-in tariff and the various maximum demand rates (lighting; heating; combined lighting, heating and cooking; and power, heating and bulk supplies) is being raised from ¼d. to ¾d. The lighting flat rate, including installation, is increased from 5d. to 6d., the lighting restricted supplies rate from 2¼d. to 3d., heating flat rate from 1¼d. to 1½d., process heating from 0·8d. to 1d., and industrial and commercial heating and cooking from 0·6d. to ¾d. Under scale "WRE" for combined lighting, heating and cooking the fixed weekly charge, payable in rent, is raised from 6d. to 7d. and the "unit" charge from ¾d. to ¾d. Under scale "WR" the "unit" charge is raised from ¾d. to 1d. For battery charging the flat rate is increased from ¾d. to 1d., and under the alternative tariff the "unit" charge is advanced from 0·6d. to ¾d.

**North-East Coast.**—REORGANISATION ON MCGOWAN BASIS.—Middlesbrough Council has agreed to co-operate with the North-Eastern Electric Supply Co., Ltd., in a plan for investigating the future of electricity supply undertakings based on the McGowan Report and White Paper published in 1937.

**Paisley.**—COMMISSIONERS AND POST-WAR SCHEME.—The Electricity Commissioners have informed the Town Council that while they approve of the proposal to convert the remainder of the 200-V, single-phase distribution system to three-phase, 250-440 V, they are unable to grant sanction to proceed with the work after the war, as everything will depend upon a detailed examination of the proposals and consideration of the circumstances then prevailing. It will be recalled that at a recent meeting of the Town Council (see *Electrical Review*, May 21st), it was decided to send the proposals to the Electricity Commissioners in order that the Council should be favourably placed to receive immediate sanction, together with any available State aid, when conditions permitted. On the basis of present-day prices the scheme was estimated to cost £129,183.

**Sheffield.**—MAIN EXTENSIONS.—The Electricity Committee is to extend mains at a cost of £3,254.

**South Shields.**—LOAN SOUGHT.—Application is being made to the Electricity Commissioners by the Town Council for sanction to borrow £700 for an electricity supply.

**Swindon.**—LOAN.—Application is being made by the Electricity Committee for sanction to borrow £6,950 for turbine foundation reconstruction.

**West Hartlepool.**—TARIFF INCREASES.—The Electricity Committee has approved a report submitted by the borough electrical engineer on the revision of electricity tariffs. Increases are

proposed in the two-rate tariff, domestic rate, weekly tariff, small power supplies, small factory supplies and hire rental of apparatus and motors.

**York.**—TRANSFORMER.—The Electricity Committee is to provide an additional 500-kVA transformer for the Tang Hall Beck area at a cost of £1,007.

## Overseas

**Argentina.**—PLANT AND OUTPUT.—The National Statistics Department has recently issued a report on the position of the electric power supply industry in the Republic at the end of 1941. From the summary published in the *Revista Electrotecnica*, the official organ of the Argentine Association of Electrical Engineers, we learn that at the end of the year under review there were 972 central power stations in the country, an increase of eight during the twelve months. Installed capacity amounted to 1,345,640 kW, an increase of 7,157 kW over 1940. The aggregate production of power in Argentina during 1941 is given as 2,644 million kWh as against 2,550 million in 1940, an increase of about 4 per cent. Of the total output, 83·6 per cent. was generated by steam plant, 11·7 per cent. by i.c. engines and 4·7 per cent. by hydro-electric plants. During the year the number of consumers increased by 61,441 to 1,567,381.

**Australia.**—SUPPLY IN MELBOURNE.—We have received from Mr. B. Woodfull, city electrical engineer of Melbourne, a copy of the Electric Supply Department's report for the year ended September 30th last. This shows that 153·9 million kWh was sold at an average price of 1·377d. Revenue rose from £853,468 to £882,503 and expenditure from £517,671 to £539,722. Fuel represented an important item in the increase in expenditure, the cost of coal per kWh generated being 0·326d. as compared with 0·268d. in the previous year. The average price per ton advanced by 4s. 7d. compared with the previous year.

**South Africa.**—PROGRESS AT VAAL RIVER.—In a survey of the work of the Electricity Control Board during 1942, published in the official journal of the Department of Commerce and Industries (March) Mr. H. J. Choles, secretary of the Board, refers to the progress made on the new Vaal power station. This station is being constructed by the Victoria Falls and Transvaal Power Co., Ltd., on behalf of the Electricity Supply Commission and will be operated by the company, which will purchase the whole of the output at cost. The ultimate capacity of the station will be 324,000 kW. Two further generating sets are expected from England some months hence, Mr. Choles states, and it should not be long before the station is put into partial commission.

# TRANSPORT

**London.**—TEMPERATURE OF TUBE TUNNELS.—Data is now being collected upon which new ventilation systems for the London underground railways will be planned, states the *Passenger Transport Journal*. Moving trains, escalators and other machinery generate heat and, as the tube system has been extended, temperatures have risen steadily. To combat this, additional power-driven fans have been installed in many stations. Tests are now being made on a section of new tunnel so that records can be obtained before the railway has begun the slow process of heating up. To take the temperatures a set of specially constructed electrical resistance thermometers is being used. A hole is drilled 3 to 4 ft. through the tunnel wall into the clay and the thermometer is inserted, the wiring being carried to the surface where a special indicating instrument records the temperature.

**Middlesbrough.**—MORE TROLLEY-BUSES.—The Tees-side Railless Traction Board is to put additional trolley-buses into service and is negotiating for further electricity supplies.

**Newcastle-on-Tyne.** — TROLLEY-BUS SERVICE EXTENSION.—The City Council proposes to apply for an extension of the time under which it has authority to extend its trolley-bus service over the Tyne Bridge into the Gateshead area. While the Gateshead & District Tramways Co., Ltd., has not objected to the suggestion, both Gateshead Corporation and Felling Urban District Council have urged Newcastle-on-Tyne Corporation to apply for a Provisional Order now to carry out the work.

# RADIO & TELEPHONY

**Holland.**—TELEPHONE STATISTICS.—According to a recently issued official report summarised in the *Journal des Télécommunications*, there were 1,459 telephone exchanges in Holland at the end of 1941, of which 574 were automatic and 885 manually operated. The bulk of the subscribers' lines are connected to the automatic exchanges which had a total of 284,148 lines as against only 59,962 lines connected to the manual exchanges.

**North Africa.**—NEW TRANSMITTER.—A 50-kW transmitter shipped from America some months ago has been put into service at Algiers. Programmes are broadcast on a wavelength of 301 metres between 5 p.m. and 1 a.m.

**South Africa.**—MUNICIPAL TELEPHONES.—The accounts of the Durban Municipal Telephone Department for the year ended July 31st, 1942, show a substantial surplus, states the *South African Engineer and Electrical Review*. Part of the profit is to be devoted to rate relief and the City Council is applying for permission to exceed the maximum of 4 per cent. of the capital debt of the undertaking.

**Spain.**—AUTOMATIC TELEPHONY.—According to the *Journal des Télécommunications*, there were 3,344 telephone exchanges in Spain at the end of 1941, of which only 47 are worked automatically. The manually operated exchanges are mostly small as may be gathered from the statement that out of a total of 260,570 subscribers' lines, no fewer than 177,156, or nearly 68 per cent. are connected to the automatic exchanges.

**Switzerland.**—BRONZE REPLACES COPPER.—The journal *Technische Mitteilingen* reports that a new regional underground telephone cable about 67½ miles long has recently been brought into operation between Chateau-d'Oex and Bulle. The cable, which comprises 84 pairs of conductors, is interesting for the reason that it is the first underground inter-urban line in Switzerland in which bronze has been used in place of the now extremely scarce electrolytic copper.

RADIO-TELEPHONIC SERVICE.—From a recent issue of the *Journal des Télécommunications* it is learned that a direct radio-telephone service has been put into operation between Berne and Madrid.

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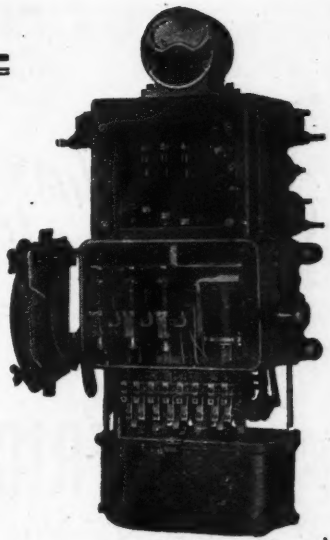

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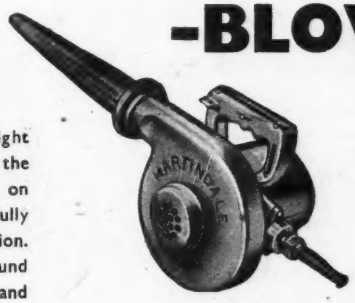


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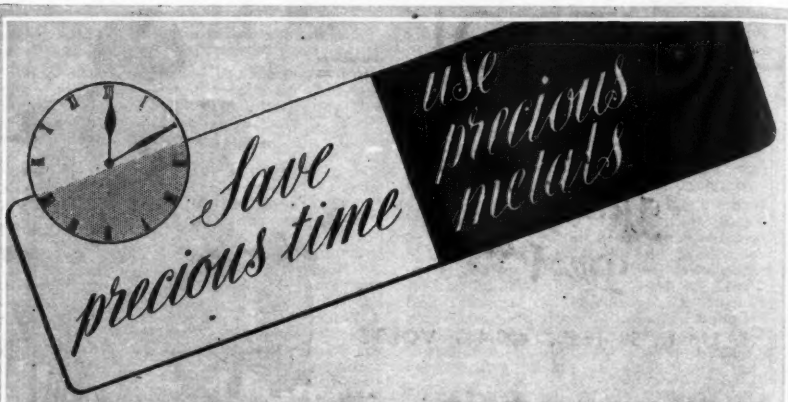


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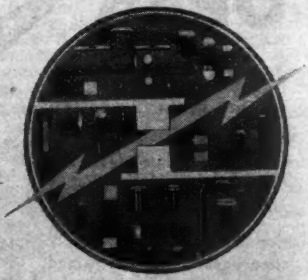

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# FINANCIAL SECTION

## *Company News. Stock Exchange Activities.*

## Reports and Dividends

**Venner Time Switches, Ltd.**—The company's accounts for 1942 reveal a substantial improvement in the net profit for the year. After providing for depreciation and war damage premiums there is a balance of £75,593 (as compared with £28,503 for the previous year), to which is added £15,611, brought in, making £91,204. After deducting £33,948 for taxation and placing £13,000 to general reserve and £10,000 to war contingency reserve, it is proposed to pay a dividend of 15 per cent., less tax, for the year on the ordinary stock (against nil), and to carry forward £15,656. The previous ordinary dividend was 20 per cent. for 1938.

**The London Electric Wire Co. & Smiths, Ltd.**, reports a net profit for 1942 (after providing for taxation) of £100,358, as compared with £89,581 in the preceding year, to which is added £50,000 from investment reserve no longer required, and £110,234 brought in. It is proposed to appropriate £50,000 for the establishment of a superannuation scheme and to pay a final ordinary dividend of 5½ per cent. for the year and leaving £128,258 to be carried forward.

**The British Electric Traction Co., Ltd.**, held its annual meeting on June 18th. The chairman, Mr. R. J. Howley, C.B.E., said that for many years they had been able to show increased gross revenue, but last year there was a slight decrease. This was due to lower receipts from two subsidiaries, necessitated by the incidence of taxation. There was, however, an increase in the profit, owing to the reduced charge for taxation. On the basis for E.P.T. which had been agreed the company was not liable for any contribution for the year ended March 31st last or for previous years. A total of £170,000 provided for this purpose had been transferred to the undivided profits account. Mr. Howley reviewed the operations of the traction companies in which the B.E.T. has investments and referred to the changing nature of transport services which he considered were not a fit subject for state ownership. Transport was a task for private enterprise, encouraged and assisted by the state.

With regard to the company's electricity supply interests, although the receipts had suffered a substantial set-back the response of their consumers to the appeal for economy had been magnificent.

**The B.E.T. Electricity Supply Co., Ltd.**, reports revenue for the year to March 31st last amounting to £78,370 as compared with £76,389 in the previous year. After providing for expenses, debenture interest and taxes there is a profit of £50,615 (£44,800). A sum of £12,800 (£13,333) goes to reserve and a dividend of 5 per cent. (against 4 per cent.) takes £37,450 (£29,960), leaving £29,992 (£29,627) to be carried forward.

**Cable & Wireless, Ltd.**, reports a revenue for 1942 of £9,907,530, as compared with £9,075,649 for 1941. Working expenses amount to £3,482,276, maintenance of cables to £1,059,716, general charges to £428,700 and rent and payments for cables, etc., to £134,554. Pensions receive £396,676, the Pacific Cable Board £16,072, directors' fees require £9,812, taxation abroad and licences £541,741, and cable renewals £129,803. The amount written off and cost of terminating joint purchase agreement and other expenditures is £329,462. The provision for E.P.T. and income tax and for transfer to special account in accordance with the agreement with H.M. Treasury is £2,100,000, and the net balance is £1,278,718 (against £88,349). The final dividend is 2½ per cent., again making 4 per cent. for the year, and £380,674 is carried forward (against £301,956 brought in). The company's E.P.T. and other appropriations of £2,840,000 for 1941, also £200,000 to general reserve, were not made during that year and are given in the 1942 report and accounts.

**Cable & Wireless (Holding), Ltd.**, report a profit of £1,221,702 for 1942, after meeting expenses, directors' fees, income tax and interest, etc., on the cumulative funded income stock. The figure for 1941 was £1,215,706. As already reported, the dividend on the ordinary stock is maintained at 4 per cent. The balance carried forward is £279,120 (against £254,905 brought in). Investments in securities, stocks and shares are shown at £18,071,405, the market value at December 31st last being £17,158,834.

**Marconi's Wireless Telegraph Co., Ltd.**, reports a revenue of £816,620 for 1942, as compared with £772,022 for the preceding year. Expenses total £364,684, depreciation requires £120,000, and provision against assets in enemy territories, reducing them to £1 nominal, £90,279, leaving a profit of £241,457 (against £232,452). As already announced, the ordinary dividend for the year is maintained at 7 per cent., by the final payment of 3½ per cent. The balance carried forward is £169,839, an increase of £82,548.

**Johnson Matthey & Co., Ltd.**—A meeting of holders of the 4 per cent. mortgage debenture stock is to be held on June 30th, at 78, Hatton Garden, E.C.1, to consider a resolution providing for the appointment of Sir Walrond Sinclair as a trustee in place of the late Sir Robert Williams.

**The Hydro-Electric Securities Corporation** has announced the payment of half-yearly dividend on the 5 per cent. class "B" cumulative participating preferred shares.

**The Electric & General Investment Co., Ltd.**, is maintaining its ordinary dividend at 9 per cent. The net profit for 1942-43, after meeting taxation, was £3,084 (against £2,865).

**The British Thermostat Co., Ltd.**, is paying a final dividend of 11 per cent., again making 18½ per cent. for the year.

## New Companies

**Variflow Products Ltd.**—Private company. Registered June 10th. Capital, £500. Objects: To carry on the business of manufacturers, repairers and hirers of, and dealers in, electrical and mechanical apparatus, accessories and com-

ponents, and particularly radio and television sets and valves, etc. Directors: G. H. Beresford, 18, Westfield Road, Rugby, and L. O. Meyer, Haytor, Lytham Road, Rugby. Secretary: A. F. Smith. Registered office: 16, Gas Street, Rugby.

**Electrical Concessionaires, Ltd.**—Private company. Registered June 11th. Capital, £100. Objects: To carry on the business of manufacturers of, and dealers in, gas or electrically operated laundry machinery, wash boilers, cisterns, drums, containers; agricultural implements, refrigerating machines, waste water meters, etc. Directors: T. Fletcher, 545, Brimshaw Road, Burnley, and J. H. Firman, 187, Casterton Avenue, Burnley. Registered office: Walton House, 1, Newman Street, W.1.

**Dingle Electric Light & Power Co., Ltd.**—Private company. Registered in Dublin June 11th. Capital, £5,000. Objects: To carry on the business of an electric light company in all its branches. Directors: J. C. Houlihan, Strand Street, Dingle, Co. Kerry; and J. Houlihan Avondale, Dingle.

**Hirst Electronic Development, Ltd.**—Private company. Registered June 9th. Capital, £1,000. Objects: to carry on the business of electrical and electronic engineers, contractors and electricians, etc. Directors: S. Hirst, The Gables, Nightingale Avenue, Langdon Hill, Essex; and F. S. Morris, 28-30, Islington High Street, N.1. Registered office: Smiths Buildings, 28-30, Islington High Street, London, N.1.

**Grenfell Engineering Co., Ltd.**—Private company. Registered June 15th. Capital, £3,000. Objects: to carry on the business of mechanical electrical and general engineers, etc. Directors: H. C. Born, 28, Cranbrook Drive, Gidea Park, Essex; and W. J. Evans, 59, Headley Drive, Ilford. Registered office: Grenfell Works, Grenfell Avenue, Romford, Essex.

**Francis Breckett, Ltd.**—Private company. Registered June 9th. Capital, £1,000. Objects: To carry on the business of electrical contractors and engineers, factors and sales agents for, and dealers in, lighting, heating, cooking, power and other electrical units, fittings and equipment, etc. W. English, 3, Everton Road, Addiscombe, is the first director. Registered office: 211, Lower Addiscombe Road, Croydon, Surrey.

# Companies' Returns

## Statements of Capital

**Electric & Musical Industries, Ltd.**—Capital, £6,266,000 in £460,000 preference stock, £2,902,874 10s. ordinary stock and 5,806,251 ordinary shares of 10s. Return dated December 31st, 1942. £460,000 preference stock and £2,902,874 10s. ordinary stock taken up. £3 10s. paid. £3,362,871 considered as paid. Mortgages and charges: Nil.

**County Electrical Services, Ltd.**—Capital, £30,000 in £1 shares. Return dated December 14th, 1942. 20,000 shares taken up. £20,000 paid. Mortgages and charges: Nil.

**Electricalities, Ltd.**—Capital, £500 in 2s. shares. Return dated December 31st, 1942. 1,750 shares taken up. £175 paid. Mortgages and charges: Nil.

**Wycombe Electrical Supplies, Ltd.**—Capital, £1,000 in £1 shares. Return dated March 1st, 1943. All shares taken up. £2 paid. £998 considered as paid. Mortgages and charges: £600.

**Insulators, Ltd.**—Capital, £25,000 in £1 shares. Return dated December 3rd, 1942 (filed March 3rd, 1943). 10,000 shares taken up. £10,000 paid. Mortgages and charges: £10,000.

**T. G. Brunskill, Ltd.**—Capital, £1,000 in £1 shares. Return dated March 3rd, 1942. 701 shares taken up. £701 paid. Mortgages and charges: £250.

**Londona, Ltd.**—Capital, £100 in £1 shares. Return dated November 19, 1942 (filed March 9th, 1943). 13 shares taken up. £13 paid. Mortgages and charges: Nil.

**Express Magneto (Repairs) & Electrical Co., Ltd.**—Capital, £2,000 in 1,500 preference and 500 ordinary shares of £1. Return dated December 14th, 1942. All shares taken up. £2,000 paid. Mortgages and charges: Nil.

**Wandleside Cable Works, Ltd.**—Capital, £35,000 in £1 shares. Return dated June 2nd (filed December 14th, 1942. 33,000 shares taken up. £33,000 paid. Mortgages and charges: Nil.

**Premier Conduits, Ltd.**—Capital, £5,000 in £1 shares. Return dated December 31st, 1942 (filed February 12th, 1943). 100 shares taken up. £100 paid. Mortgages and charges: Nil.

## Mortgages and Charges

**Frank Curtis (Electrical Engineers), Ltd.**—Debenture dated May 25th, 1943, to secure all moneys due or to become due from the company to Barclays Bank, Ltd., charged on the company's undertaking and property, present and future, including uncalled capital.

**Electro Methods, Ltd.**—Satisfaction in full on April 22nd, of floating charge dated February 12th, 1942, and registered March 2nd, 1942, securing all moneys due or to become due from the company to Barclays Bank, Ltd.

**E. Dawson (Lamp Factors), Ltd.**—Satisfaction to the extent of £2,500 on May 12th, 1943, of debenture registered December 13th, 1938.

## Increase of Capital

**Record Electrical Co., Ltd.**—The nominal capital has been increased by the addition of £200 beyond the registered capital of £30,000. The additional capital is divided into 4,000 ordinary shares of 1s. each.

## Companies to be Struck Off Register

The following companies will, unless cause is shown to the contrary, be struck off the Register at the expiration of three months from June 18th:—Blandford Radio, Ltd.; Lighting & Heating (Stepney), Ltd.; and Woodford Electrical Co., Ltd.

# Bankruptcies

**A. R. Carter,** electrical contractor, 2, Priory Avenue, Mile End, Bridgend, Glam.—Discharged April 21st, subject to bankrupt consenting to judgment for £120 being entered against him by the Official Receiver.

# STOCKS AND SHARES

TUESDAY EVENING.

MEMBERS of the Stock Exchange cannot complain of being overworked. Shortage of staff, cash dealings, and other war conditions are present in Stock Exchange as in most offices, but the volume of business has dwindled to meagre proportions and no markets are really active. A welcome development during the past few days has been a fairly general rise in British Government and kindred gilt-edged securities. This as a rule exercises a strengthening effect upon investment stocks and shares of every kind, but its influence has not yet spread to the general markets. Prices in the accompanying lists show few alterations. Among the 33 quotations in the Home electricity supply group, there is but a single change: the solitary exception is a rise of 6d. in Metropolitan Electric ordinary to 39s.

### Cable & Wireless

Cable & Wireless ordinary stock, marked ex dividend, held its previous price of 79. Interest is lacking in the market. The report of the operating company shows expansion both in earnings, assets and expenses. The receipts from messages and wayleaves came to the astronomical figure of £9,766,526; taxation took £2,100,000; the fixed assets are a little over £23,000,000. The evidence of improvement may be expected to have the effect of keeping the holding company's stocks, preference and ordinary alike, under investment notice. Speculative interest is maintained by the fact of the ordinary stock standing so considerably under par, while the yield on the present figure, 5$\frac{1}{16}$ per cent. on the money, is not bad considering the post-war prospects of the combine.

Marconi's Wireless Telegraph Co. published its report and figures on the same day as the Cable & Wireless operating company. The Marconi profits and expenses are up, and the net profit of £241,457 is £9,000 better on the year. The dividend is, as previously announced, again 7 per cent.

### G.E.C.

The General Electric Co.'s financial year ends on March 31st, and last year the dividend was declared on July 17th, followed a few days later by the issue of the report. The company's annual meeting was held on July 30th. At this time of year, interest attaches to the estimates of the forthcoming dividend, which is for the full period of twelve months. In each of the past two years, the G.E.C. has paid a dividend and bonus amounting together to 17½ per cent. In previous years, the rate was 20 per cent.

Conservative opinion takes the view that the dividend will be repeated at 17½ per cent., continuing the policy laid down by the late chairman, Lord Hirst. At the present buying price of 89s. the yield, on the basis of the 17½ per cent. dividend, would be £3 18s. 8d. per cent., without making allowance for accrued dividend. The return—gilt-edged for an industrial ordinary share—betokens the respect felt by the investor for the company. That the G.E.C. is well able to return to the previously paid 20 per cent. dividend, if the board deemed it prudent to do so, is generally agreed. And the hope, so often heard in the past, that the dividend might be paid half-yearly, instead of once a year, is again being voiced.

### Mixed Fluctuations

Possibly the rise of 14s. 6d. in Callender's Cable, from 82s. one day to 96s. 6d. the next, due to the increase of 5 per cent. in the dividend, proved too much temptation for profit-takers to resist; at all events, the selling overtook the buying and the price has reacted to 94s. 3d. This includes the dividend of 3s. gross, and allows a yield of £4 6s. 3d. per cent., which looks a liberal return compared with 4 per cent. obtainable from Henleys at 25s. and £3 16s. 2d. per cent. from British Insulated which, at 5½, are $\frac{1}{16}$ down. British Aluminium fell 1s. to 48s. 6d. Hall Telephones at 25s. 3d. and Telephone Manufacturing at 11s. 3d. are a few pence easier. Greenwood & Batley hardened to 40s. and Crabtrees to 38s. Movements in the radio group have been of mixed variety. Further support for E.K. Cole has put up the price to 23s. but Cossors are easier at 20s. 6d. E.M.I. shares are a shade harder at 22s. 9d. Recovery of the dividend deducted from the price, has left Ferranti preference at 28s. 9d. Among the heavy industries, Vickers at 19s. are 6d. down.

### Whitehall Electric

On Wednesday in this week, Whitehall Electric Investments holds its 21st ordinary general meeting, the first since the scheme of arrangement and reduction of capital came into operation. The directors present a consolidated balance sheet which gives the total of investments as being £3,332,000. This takes no account of the Athens undertaking, which stood in the previous balance sheet at £2½ million, and in regard to which there is still no information available. On the figures as presented by the directors, the preference stock is still covered by assets, the ordinary works out to about 8s. per £1 of stock, excluding the Athens interest. The market price of the ordinary at the present time is 7s. 9d. middle and it

(*Continued on page* 865)

# ELECTRICAL INVESTMENTS

## *Prices, Dividends and Yields*

| Company | Dividend: Previous | Dividend: Last | Middle Price June 22 | Rise or Fall | Yield p.c. £ s. d. |
|---|---|---|---|---|---|
| **Home Electricity Companies** | | | | | |
| Bournemouth and Poole .. .. | 12½ | 12½ | 56/6 | .. | 4 6 10 |
| British Power and Light .. .. | 6 | 7 | 31/– | .. | 4 10 4 |
| City of London .. | 7 | 7 | 30/– | .. | 4 13 4 |
| Clyde Valley .. | 8 | 8 | 39/– | .. | 4 2 0 |
| County of London | 8 | 8 | 39/– | .. | 4 2 0 |
| Edmundson's: | | | | | |
| 7% Pref. .. | 7 | 7 | 34/– | .. | 4 2 4 |
| Ord. .. .. | 6 | 6 | 28/6 | .. | 4 4 3 |
| Elec.Dis.Yorkshire | 9 | 9 | 44/6 | .. | 4 1 0 |
| Elec. Fin. and Securities .. | 12½ | 12½ | 52/– | .. | 4 16 1 |
| Elec. Supply Corporation .. | 10 | 10 | 46/– | .. | 4 7 0 |
| Isle of Thanet .. | 2 | Nil | 17/– | .. | — |
| Lancs. Light and Power .. | 7½ | 7½ | 34/6 | .. | 4 7 0 |
| Llanelly Elec. .. | 5½ | 6 | 26/– | .. | 4 12 4 |
| Lond.Assoc.Electric | 4 | 3 | 22/– | .. | 2 14 10 |
| London Electric | 6 | 6 | 26/6 | .. | 4 10 7 |
| London Power Red. Deb. .. .. | 5 | 5 | 104½ | .. | 4 15 7 |
| Metropolitan E.S. | 8 | 8 | 39/– | +6d. | 4 2 2 |
| Midland Counties | 8 | 8 | 38/– | .. | 4 4 2 |
| Mid. Elec. Power | 9 | 9 | 43/– | .. | 4 3 9 |
| Newcastle Elec.. . | 7 | 7 | 31/– | .. | 4 10 5 |
| North Eastern Elec. Ordinary .. | 7 | 7 | 32/– | .. | 4 7 6 |
| 7% Pref. .. | 7 | 7 | 34/– | .. | 4 2 4 |
| Northampton .. | 10 | 10 | 47/6 | .. | 4 4 0 |
| Notting Hill 6% Pref. (£10) .. | 6 | Nil | 10 | .. | — |
| Northmet Power: | | | | | |
| Ordinary .. | 7 | 7 | 36/6 | .. | 3 16 8 |
| 6% Pref. .. | 6 | 6 | 31/– | .. | 3 17 5 |
| Richmond Elec. | 6 | 6 | 26/– | .. | 4 12 4 |
| Scottish Power .. | 8 | 8 | 37/6 | .. | 4 5 4 |
| Southern Areas | 5 | 5 | 22/6 | .. | 4 9 0 |
| South London .. | 7 | 7 | 26/– | .. | 5 7 8 |
| West Devon .. | 5 | 5 | 23/– | .. | 4 7 0 |
| West Glos. .. | 4½ | 3½ | 23/– | .. | 3 0 10 |
| Yorkshire Elec. | 8 | 8 | 40/– | .. | 4 0 0 |
| **Overseas Electricity Companies** | | | | | |
| Atlas Elec. .. | Nil | Nil | 5/6 | .. | — |
| Calcutta Elec. .. | 7* | 6* | 37/6 | +1/– | 3 4 0 |
| Cawnpore Elec. | 10 | 10 | 32/– | .. | 6 5 0 |
| East African Power | 7 | 7 | 32/6 | .. | 4 6 2 |
| Jerusalem Elec. | 7 | 5 | 28/6 | .. | 3 10 2 |
| Kalgoorlie (10/–) | 7½ | 5 | 9/– | .. | 5 11 1 |
| Madras Elec. .. | 6* | 4* | 24/6 | .. | — |
| Montreal Power | 1½ | 1½ | 29 | –1 | 5 3 5 |
| PalestineElec."A" | Nil | 4* | 43/3 | +1/– | 1 17 0 |
| Perak Hydro-elec. | 6 | 7 | 9/– | .. | — |
| Shawinigan Power | 83cts. | 90cts. | 21 | .. | — |
| Tokyo Elec. 6% | 6 | 6 | 20 | .. | — |
| VictoriaFallsPower | 15 | 15 | 4½ | .. | 3 11 9 |
| WhitehallInv.Pref. | — | — | 25/– | .. | 4 16 1 |

| Company | Dividend: Previous | Dividend: Last | Middle Price June 22 | Rise or Fall | Yield p.c. £ s. d. |
|---|---|---|---|---|---|
| **Public Boards** | | | | | |
| Central Electricity: | | | | | |
| 1955–60 (Civil Defence) .. | — | 3 | 100 | .. | 3 0 0 |
| 1955–75 .. | 5 | 5 | 115 | .. | 4 7 0 |
| 1951–73 .. | 4½ | 4½ | 107 | .. | 4 4 1 |
| 1963–93 .. | 3½ | 3½ | 103½ | .. | 3 7 8 |
| 1974–94 .. | 3½ | 3½ | 101 | .. | 3 3 9 |
| LondonElec.Trans. Ltd. .. .. | 2½ | 2½ | 96½ | .. | 2 11 10 |
| London & Home Counties 1955–75 | 4½ | 4½ | 111 | .. | 4 1 1 |
| Lond.Pass.Trans.: | | | | | |
| A .. .. | 4½ | 4½ | 116½ | .. | 3 17 3 |
| B .. .. | 5 | 5 | 115½ | .. | 4 6 7 |
| C .. .. | 2⅞ | 3 | 61½ | .. | 4 17 7 |
| WestMidlandsJ.E.A. 1948–68 .. | 5 | 5 | 110 | .. | 4 11 0 |
| **Telegraph and Telephone** | | | | | |
| Anglo-Am. Tel.: | | | | | |
| Pref. .. .. | 6 | 6 | 112½ | .. | 5 6 9 |
| Def. .. .. | 1½ | 1½ | 28 | .. | 5 7 2 |
| Anglo-Portuguese | 8 | 8 | 24/– | –6d. | 6 13 4 |
| Cable & Wireless: | | | | | |
| 5½ Pref. .. | 5½ | 5½ | 111 | –½ | 4 19 3 |
| Ord. .. .. | 4 | 4 | 79 | .. | 5 1 4 |
| CanadianMarconi $1 | Nil | 4cts. | 10/6 | –3d. | — |
| Globe Tel. & Tel.: | | | | | |
| Ord. .. .. | 8½* | 5* | 35/– | .. | 2 17 2 |
| Pref. .. .. | 6 | 6 | 28/9 | .. | 4 3 6 |
| GreatNorthernTel. (£10) .. .. | Nil | Nil | 24 | .. | — |
| Inter. Tel. & Tel. | Nil | Nil | 16 | –2 | — |
| Marconi-Marine.. | 7½ | 7½ | 33/– | .. | 4 11 0 |
| Oriental Tel. Ord. | 16 | 10 | 41/3 | .. | — |
| Telephone Props. | 6 | Nil | 13/9 | .. | — |
| Tele. Rentals (5/–) | 10 | 10 | 11/– | .. | 4 11 0 |
| **Traction and Transport** | | | | | |
| Anglo-Arg. Trans.: | | | | | |
| First Pref. (£5) | Nil | Nil | 4/6 | .. | — |
| 4% Inc. .. | Nil | Nil | 13 | .. | — |
| Brit.Elec.Traction: | | | | | |
| Def. Ord. .. | 45 | 45 | 1085 | .. | 4 3 2 |
| Pref. Ord. .. | 8 | 8 | 170 | .. | 4 14 2 |
| Bristol Trams .. | 10 | 10 | 50/– | .. | 4 0 0 |
| Brazil Traction .. | $1 | $1 | 32½ | +½ | — |
| Calcutta Trams.. | 8 | 5½ | 42/6 | .. | 2 11 9 |
| Cape Elec. Trams | 5 | 6 | 25/6 | .. | 4 14 0 |
| Lancs. Transport | 10 | 10 | 44/3 | .. | 4 10 4 |
| Mexican Light: | | | | | |
| 1st Bonds .. | 5 | 5 | 107½ | .. | 4 13 0 |
| Rio 5% Bonds .. | 5 | 5 | 104½ | .. | 4 15 9 |
| Southern Rly.: | | | | | |
| 5% Prefd. .. | 5 | 5 | 75 | .. | 6 13 4 |
| 5% Pref. .. | 5 | 5 | 111½ | –½ | 4 9 8 |
| T. Tilling .. | 10 | 10 | 53/6 | +9d. | 3 15 0 |
| West Riding .. | 10 | 10 | 43/6 | +6d. | 4 12 0 |

(*Continued on next page*)

* Dividends are paid free of Income Tax.

| Company | Dividend Previous | Dividend Last | Middle Price June 22 | Rise or Fall | Yield p.c. |
|---|---|---|---|---|---|
| **Equipment and Manufacturing** | | | | | £ s. d. |
| Aron Elec. Ord... | 7½ | 10 | 41/3 | .. | 4 17 0 |
| Assoc. Elec.: | | | | | |
| Ord. .. .. | 10 | 10 | 49/6 | .. | 4 1 0 |
| Pref. .. .. | 8 | 8 | 40/-xd | +6d. | 4 0 0 |
| AutomaticTel.&Tel. | 12½ | 12½ | 58/- | .. | 4 6 2 |
| Babcock & Wilcox | 11 | 11 | 48/- | .. | 4 11 7 |
| British Aluminium | 10 | 10 | 48/6 | −1/- | 4 2 6 |
| British Insul. Ord. | 20 | 20 | 5′ | −¼ | 3 16 2 |
| British Thermostat (5/-) .. .. | 18½ | 18½ | 17/6 | .. | 5 5 9 |
| British Vac.Cleaner (5/-) .. .. | 10 | 15 | 24/3 | .. | 3 1 10 |
| Brush Ord. (5/-) | 6 | 8 | 8/- | .. | 5 0 0 |
| Burco (5/-) .. | 15 | 15 | 14/3 | .. | 5 5 1 |
| Callender's .. | 15 | 20 | 94/3 | −¼ | 4 4 9 |
| ChlorideElec.Storage | 15 | 15 | 82/6 | .. | 3 12 8 |
| Cole, E. K. (5/-) | 7 | 10 | 23/- | +1/6 | 2 3 6 |
| Consolidated Signal | 17 | 24 | 5⅞ | .. | 4 8 3 |
| Cossor, A. C. (5/-) | 15 | 10* | 20/6 | −6d | 1 16 9 |
| Crabtree (10/-) .. | 17½ | 17½ | 38/- | +6d. | 4 12 4 |
| Crompton Parkinson Ord. (5/-) .. | 20 | 20 | 25/- | .. | 4 0 0 |
| E.M.I. (10/-) .. | 6 | 6 | 22/9 | +3d. | 2 12 9 |
| Elec. Construction | 10 | 10 | 44/- | .. | 4 11 0 |
| Enfield Cable Ord. | 12½ | 12½ | 54/6 | .. | 4 11 9 |
| Elect. Switchgear (10/-) .. .. | 10 | 10 | 20/- | .. | 5 0 0 |
| English Electric | 10 | 10 | 48/- | .. | 4 3 4 |
| Ensign Lamps(5/-) | 25 | 25 | 21/3 | .. | 5 17 8 |
| Ericsson Tel.(5/-) | 22† | 20† | 47/6 | .. | 2 2 2 |
| Ever Ready (5/-) | 40 | 40 | 37/6 | .. | 5 6 8 |
| Falk Stadelmann | 7½ | 7½ | 31/- | .. | 4 16 9 |
| Ferranti Pref. .. | 7 | 7 | 28/9xd | +6d. | 4 17 5 |
| G.E.C.: Pref. .. | 6½ | 6½ | 33/- | .. | 3 18 9 |
| ,, Ord. .. | 17½ | 17½ | 88/6 | −6d. | 3 19 2 |
| Greenwood&Batley | 15 | 15 | 40/- | +1/- | 7 10 0 |
| HallTelephone(10/-) | 12½ | 12½ | 25/3 | −6d. | 4 19 0 |
| Henley's (5/-) .. | 20 | 20 | 25/-xd | .. | 4 0 0 |
| 4½% Pref. .. | 4½ | 4½ | 23/- | .. | 3 18 3 |
| Hopkinsons .. | 15 | 17½ | 63/9 | .. | 5 9 9 |
| India Rubber Pref. | 5½ | 5½ | 20/- | .. | 5 10 0 |
| Intl. Combustion | 30 | 30 | 6½ | .. | 4 17 10 |
| Johnson & Phillips | 15 | 15 | 69/6 | .. | 4 6 2 |
| LancashireDynamo | 20 | 22½ | 91/3 | .. | 4 18 9 |
| Laurence,Scott(5/-) | 15 | 12½ | 12/- | .. | 5 4 2 |
| London Elec. Wire | 7½ | 7½ | 31/6 | .. | 4 15 3 |
| Mather & Platt | 10 | 10 | 48/9 | .. | 4 2 0 |
| Met.Elec.CablePref. | 5½ | 5½ | 21/3 | .. | 5 3 6 |
| Murex .. .. | 20 | 20 | 5½ | .. | 3 16 6 |
| Pye Deferred (5/-) | 25 | 25 | 22/6 | .. | 5 11 1 |
| Revo (10/-) .. | 20 | 17½ | 35/6 | .. | 4 18 7 |
| Reyrolle .. .. | 12½ | 12½ | 67/6 | .. | 3 14 0 |
| Siemens Ord. .. | 7½ | 7½ | 30/- | −3d. | 5 0 0 |
| Strand Elec. (5/-) | 4 | 7½ | 6/6 | .. | 5 15 5 |
| Switchgear & Cowans (5/-) .. | 10 | 20 | 15/6 | .. | 6 9 0 |
| T.C.C. (10/-) .. | 5 | 5 | 16/3 | .. | 3 1 7 |
| T.C. & M. .. | 10 | 10 | 50/- | .. | 4 0 0 |
| TelephoneMfg.(5/-) | 9 | 9 | 11/9 | −3d. | 3 16 7 |
| Thorn Elec. (5/-) | 20 | 20 | 21/3 | .. | 4 14 1 |
| Tube Investments | 20 | 20 | 91/6 | −6d. | 4 7 4 |
| Vactric (5/-) .. | Nil | Nil | 12/6 | .. | — |
| Vickers (10/-) .. | 10 | 10 | 19/- | −6d. | 5 5 3 |
| WalsallConduits(4/-) | 55 | 55 | 43/- | .. | 5 2 2 |
| Ward & Goldstone (5/-) .. .. | 20 | 20 | 22/6 | .. | 4 9 0 |
| WestinghouseBrake | 10 | 12½ | 65/- | .. | 3 17 0 |
| West, Allen (5/-) | 7½ | 7½ | 7/- | .. | 5 7 2 |

* 5 per cent. tax-free. † Dividends free of Income Tax.

## Stocks and Shares (*Continued from page* 863)

must depend, of course, upon the developments in the Near East as to whether the Athens undertaking becomes once more of value, in which case the ordinary shares would automatically improve in price.

### Miscellaneous Matters

Home railway stocks are neglected, and the prior-charge issues continue to be quietly pressed for sale. Southern 5 per cent preference is 10s. down at 111½. The London Passenger Transport stocks hold to their previous prices. Thomas Tilling shares are better at 53s. 6d. and West Ridings at 43s. 6d. have gained the pence. Calcutta Trams are the subject of considerable notice, and the big rise that lifted the price to 42s. 6d. is fully maintained. Other Indian industrial shares are a good market. Calcutta Electric Supply ordinary at 37s. 6d. have put on 1s. and Cawnpores at 32s. keep their florin gain of last week.

### "Local Authority" Stock

Ten years ago the London Passenger Transport Board issued nearly £10,000,000 of its 4½ per cent. "L.A." stock 1975-2023 to four authorities, the County Councils of London, Middlesex and Hertfordshire and West Ham Corporation. In each case the authorities transferred to the Transport Board various tramway undertakings, in payment for which the Board issued this stock, with the proviso that none of it should be sold or otherwise disposed of, except with the consent of the Board, before July 1st this year. Owing to the scarcity of gilt-edged stock now available to the investor, it had been thought that possibly some of this £9,835,036 stock would become available for marketing purposes at the beginning of July.

The West Ham Corporation has stated it does not intend to dispose of the holding for the time being. The Middlesex County Council has not yet discussed the matter. The two other County Councils have arrived at no decision so far. In point of fact, the matter is of less consequence now than it would have been six months ago at which time so much capital was seeking employment that gilt-edged securities were being gladly taken. Now, in the absence of any important vesting schemes, there is no special source of demand for such securities.

# NEW PATENTS

## *Electrical Specifications Recently Published*

*The numbers under which the specifications will be printed and abridged are given in parentheses. Copies of any specification (1s. each) may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2.*

AGA-BALTIC Radio Aktiebolag.—" Remote control systems." 11802/40. September 6th, 1939. (553668.)

Akt.-Ges. Brown, Boveri & Cie.—" Multiple-break gas-blast circuit-breakers." 8484/41. February 27th, 1940. (553734.)

H. E. Bayliss, and Automatic Coil Winder & Electrical Equipment Co., Ltd.—" Coil-winding machines." 923. January 22nd, 1942. (553685.)

British Thomson-Houston Co., Ltd.—" Holders for tubular electric lamps." 3876/42. March 27th, 1941. (553689.) " Electro-magnetic vibratory regulators." 300/42. January 9th, 1941. (553713.) " Electromagnetic induction apparatus." 16137/41. December 18th, 1940. (553801.) " Multi-layer electrical coils or windings and methods and apparatus for making the same." 2138/42. February 18th, 1941. (553813.)

British Thomson-Houston Co., Ltd., W. J. Sims and B. P. Brunt.—" Production of a textile fabric embodying conducting threads capable of use as an electrical heating element." 16723. December 29th, 1941. (553804.)

Chloride Electrical Storage Co., Ltd., and R. Gray.—" Electric terminals." 2061. February 16th, 1942. (553722.)

Creed & Co., Ltd., and A. E. Thompson.—" Telegraph apparatus." 15386. November 28th, 1941. (553680.)

F. B. Dehn (Wells-Gardner & Co., and Gard-Well Co., Inc.).—" Emergency radio transmitters." 11149. September 1st, 1941. (553738.)

General Electric Co., Ltd., and W. R. Rose.—" Automatic tuning devices for wireless apparatus." 5342. April 25th, 1941. (553786.) " Automatic tuning devices for wireless apparatus." 5343. April 25th, 1941. (553787.)

General Electric Co., Ltd., English Electric Co., Ltd., and J. W. Gibson.—" Electric fuses." 2048. February 16th, 1942. (553761.)

Ges. zür Forderung der Forschung auf dem Gebiete der Technischen Physik an der Eidgenossischen Technischen Hochschule.—" Apparatus for supplying a surface uniformly with electrons." 16366/41. January 29th, 1941. (553755.)

C. W. Hughes.—" Electric automatic control apparatus." 15520. December 2nd, 1941. (553767.)

Johnson & Phillips, Ltd., and P. M. Hollingsworth.—" Electric cables." 995. January 23rd, 1942. (553716.)

Marconi's Wireless Telegraph Co., Ltd.—" Glass seals." 15438/41. November 30th, 1940. (553746.)

Maschinenfabrik Oerlikon.—" Apparatus for the protection of high tension windings against surge pressures." 17649/42. December 15th, 1941. (Addition to 551968.) (553699.)

Messier Aircraft Equipment, Ltd., and A. Arnot.—" Electrically operated distant-control devices." 12260. September 22nd, 1941. (553789.)

Midland Electric Manufacturing Co., Ltd., and A. W. Vicary.—" Electric switch mountings." 3836. March 23rd, 1942. (553822.)

E. H. Morton.—" Portable pneumatically or electrically operated tools." 4206. March 30th, 1942. (553726.)

Patelhold Patentverwertungs & Elektro-Holding Akt. - Ges.—" Demountable artificially cooled transmitting electron-discharge tube." 16809/41. December 30th, 1940. (553805.)

Philips Lamps, Ltd. (Naamlooze Vennootschap Philips' Gloeilampenfabrieken).—" Radio-receiving installation comprising a plurality of spaced receiving points." 14071. October 31st, 1941. (553671.) " Electrical rectifying devices." 2067. February 16th, 1942. (553723.)

Standard Telephones & Cables, Ltd., and J. S. P. Robertson.—" Microphones." 15342. November 28th, 1941. (553677.)

Standard Telephones & Cables, Ltd., A. A. New, S. G. Foord and D. R. Beckwith.—" Electric insulating materials." 15343. November 28th, 1941. (553766.)

Vauxhall Motors, Ltd., D. B. Foster, M.W. Thring and M. Pirani.—" Electrostatic gas cleaner." 16040. December 12th, 1941. (553753.)

Westinghouse Electric International Co.—" Electric circuit-interrupters of the fluid-blast type." 361/42. January 9th, 1941. (553714.) " Composite moulded articles formed of fibrous material and a binder." 1518/42. February 5th, 1941. (553717.) " Electrode structure of electric discharge devices." 5783/42. April 24th, 1941. (553774.)

# TRADE MARK APPLICATIONS

RECENT applications for British trade marks include the following, objections against which may be entered within a month of June 16th:—

ACE. No. 621,591, Class 7. Machine tools, parts of machine tools (not included in other classes and not tools for use in machine tools), electric motors (not for agricultural use or for vehicles) and machine couplings.—Margaret Urquhart and Robert Urquhart, trading as William Urquhart, 1023-1027, Garratt Lane, London, S.W.17. To be associated with No. 621,592.(3392) ix.

VICSOL (design). No. 662,014, Class 9. Electric soldering irons and electric tinning pots.—Thomas Leeman, 34, Palmerston Road, South Acton, London, W.3.

DURACLAD. No. 622,456, Class 9. Insulated electric conductors, insulated electric wire, insulated electric cables.—Duratube & Wire, Ltd., 16, Hanworth Road, Feltham, Middlesex. To be associated with No. 622,457 (3400) xvii and others.

STENOR. No. 622,594, Class 9. Scientific instruments and apparatus, and electrical instruments and apparatus (not included in

other classes); all for use in motor vehicles.—Stenor, Ltd., Steinorizer Works, 37, Kew Foot Road, Richmond, Surrey. To be associated with No. 622,588 (3403) i and others.

STANENE. No. 622,698, Class 9. Cables, connections, terminals, distribution boxes, junction boxes, condensers, coils and transformers, all being electrical goods; electric transmission systems, and electric transmitting apparatus.—Standard Telephones & Cables, Ltd., Connaught House, 63, Aldwych, London, W.C.2. To be associated with No. 618,527 (3348) xvii.

WESTREX SOUND SYSTEM (design). No. 622,829, Class 9. Sound reproducing installations, instruments and apparatus. To be associated with No. 622,830 (3403) ix. WESTREX. No. 622,830, Class 9. Sound reproducing installations, instruments and apparatus. To be associated with No. 622,829 (3403) ix. Western Electric Export Corporation (a Corporation organised and existing under the laws of the State of Delaware, U.S.A.), 195, Broadway, New York City, N.Y., U.S.A. Address for service is, c/o F. C. Tomlins, 5, Mornington Road, Woodford Green, Essex.

ENCOGAS. No. 622,846, Class 11. CARMONITE. No. 622,847, Class 11. Furnaces and plant for use in the heat treatment of metals; gas generating plant.—Wild-Barfield Electric Furnaces, Ltd., Elecfurn Works, Watford By-Pass, Watford, Herts.

# CONTRACT INFORMATION

## *Accepted Tenders and Prospective Electrical Work*

## Orders Placed

**London.**—CAMBERWELL.—Works Committee. Accepted. Electric baling press (£310).—Hindle, Son & Co.

ISLINGTON.—Electricity Committee. Accepted. Cables for twelve months.—Edison Swan Cables; Telegraph Construction & Maintenance Co.; Aberdare Cables; Britannic Electric Cable & Construction Co.; British Insulated Cables.

**Middlesbrough.** — Corporation. Accepted. Three electric fans for the gasworks engine house (£225).—Keith Blackman.

**Warrington.** — Electricity Committee. Accepted. Transformers for twelve months.—Electric Construction Co., Ltd.

Transport Committee. Accepted. Potential battery charging set.—Crypton Equipment. 40 batteries for electric vehicles.—Chloride Electrical Storage Co.

Libraries Committee. Accepted. Amplifying equipment.—C. H. & J. Dawson.

## Contracts in Prospect

*Particulars of new works and building schemes for the use of electrical installation contractors and traders. Publication in this section is no guarantee that electrical work is definitely included. Alleged inaccuracies should be reported to the Editors.*

**Accrington.**—Police garage; H. Sanderson, borough surveyor, Town Hall.

**Andover.**—Cottages at Abbotts Ann, Upper Clatford, etc., for R.D.C.; F. Henshaw, architect, Westminster Bank Chambers, Bridge Street, Andover.

**Ardwick.**—Works canteen, Wentworth Street; A. Pickles, architect, 3, Ward's End, Halifax.

**Ashington.**—Communal feeding centres at Bothal and South Schools (£873 each); B. Preston, surveyor, U.D.C. offices, Ashington, Northumberland.

**Bangor.**—Additions and new pasteurising plant, Anglesey & Caernarvonshire Farmers' Dairies, Ltd., Snowdon Buildings.

**Barrow-in-Furness.** — Garages, Bridgegate Farm, Flass Lane; F. L. Wooldridge, borough surveyor, Town Hall.

**Beverley.**—Houses for R.D.C.; G. Palfreyman, surveyor, 36, Market Place, Beverley.

**Bicester.**—British Restaurant for U.D.C.; surveyor, The Causeway, Bicester, Oxon.

**Bideford.**—Agricultural houses, Crosspark, Woolsery and Natcott Hartland, for R.D.C.; clerk, Market Place.

**Blackpool.**—Canteen, transport depot (£1,000); borough engineer.

**Brandon.**—Four more British Restaurants; J. Addison, surveyor, U.D.C. offices, Brandon, Co. Durham.

**Bristol.**—Police garage (£1,890); city engineer.

**Caernarvon.**—Additional municipal offices, Market Street; H. Evans, borough surveyor, Guildhall.

**Cheltenham.**—Community centre, St. Marks; borough engineer.

**Darlington.**—Wartime nursery, Bedford Street, and second British Restaurant; borough engineer.

Canteen kitchen; Whessoe Foundry Co., Ltd.

**Derbyshire.**—Youth centre, Stanton Road, Ilkeston; canteen kitchen, Melbourne Council School; and extensions to Council School, Frecheville, for canteen kitchen and dining hall; J. Harrison, county architect, St. Mary's Gate, Derby.

**Gloucestershire.**—Approved school, Bowden Hall (£5,188); county architect, Shire Hall, Gloucester.

**Great Yarmouth.**—Remand home for girls at Bramerton; F. Conway, town clerk, Town Hall.

**Hendon.**—British Restaurant, Hale Lane (£2,336); R. Malcolm, Ltd., builders, Stonegrove Park Estate, Edgware.

British Restaurant, Hartley Avenue (£2,090); Mattock & Parsons, Ltd., builders, Gray's Inn Road, W.C.1.

**Greenock.**—Houses (200) for Corporation (electric lighting); director of housing, Municipal Buildings.

**Isle of Wight.**—Shelters at Mental Hospital (£1,293); county architect, County Hall, Newport, I.O.W.

**Kettering.**—Houses at Weldon, Gretton, Weston, Sutton Bassett and Brampton Ash for

R.D.C.; H. R. Surridge, architect, Bank Chambers.

**Lanarkshire.**—Building for X-ray department, County Hospital, Motherwell (£4,500); county architect, 34, Albert Street, Motherwell.

**Lancashire.**—Extensions to Grammar School, Morecambe; L. Evans, county architect, County Buildings, Fishergate Hill, Preston.

**Leicester.**—Extensions to hospital; secretary, City General Hospital, Gwendolen Road.

**Liverpool.**—Classroom accommodation at St. Philomena's R. C. School, Fazakerley (£1,006); L. H. Keay, city architect, Blackburn Chambers, Dale Street.

**London.**—ST. PANCRAS.—Day nursery, Prince Albert Road (£1,560); borough engineer, St. Pancras Town Hall, Euston Road, N.W.1.

LEWISHAM.—Canteen, Malyons Works, Malyons Road; A. Roberts.

**Manchester.**—Wartime day nursery, Chapman Street, Gorton (£2,750); A. Hodkinson, Ltd., building contractors, 62, Greenhill Street, Greenheys, Manchester, 15.

Nursery, Casson Road, Gorton (£2,800); James Miller & Partner, Ltd., builders, Birmingham.

Factory canteen, Hulme; H. S. Fairhurst & Son, architects, Chancery Chambers, 55, Brown Street, Manchester, 2.

**Melton Mowbray.**—British Restaurant, Burton Street; W. H. Jarvis, surveyor, Town Hall.

**Middlesbrough.**—Nurses' home for the maternity hospital staff; borough engineer.

**Morpeth.**—British Restaurant, Town Hall; F. Perkins, borough surveyor.

**Newcastle-on-Tyne.**—Fire station, Benfield Road, for the N.F.S.; divisional officer, Newcastle.

**North Riding.**—Central school kitchens at Redcar and Pickering; county architect, County Hall, Northallerton.

**Northumberland.**—Farm workers' houses at Hexham, Rothbury and Bellingham; Hetherington and Wilson, architects, 52, Westgate Road, Newcastle-on-Tyne.

**Salop.**—Council school, Market Drayton; G. A. Chant, county architect, 5, Belmont, Shrewsbury.

**Shipston-on-Stour.**—Houses, Great Wolford Honington, Oxhill and Tysoe, for R.D.C.; E. H. Earp, architect, 48, Henley Street, Stratford-on-Avon.

**South Hetton.**—Miners' canteen; G. M. Pearson, Houghton Road, Hetton-le-Hole, Co. Durham.

**Stockton-on-Tees.**—Additions to store, Park field Works; Ashmore, Benson Pease & Co., Ltd.

**Sunderland.**—Garages and control rooms, King's Road, Southwick, for the N.F.S.; R. F. Patterson, Divisional Officer, Sunderland.

**Wallsend.**—Wartime nurseries, East Park and Station Road; J. A. Blench, borough engineer, Town Hall.

**West Hartlepool.**—Works depot, Redworth Street and British Restaurant, Spring Gardens Road; borough engineer.

**West Kesteven.**—Houses (18), for R.D.C.; T. W. Mawer, architect, Council Offices, 19, Watergate, Grantham.

**Wolverhampton.**—Additional school feeding centres; W. M. Law, borough engineer, Town Hall.

**Worcestershire.**—Extensions to school, Cofton; H. Rowe & Son, county architects, 38, Foregate Street, Worcester.

## Transport Change-overs

### *Inter-running Problem*

DURING a week-end course on the reconstruction of cities held at Manchester University recently Mr. R. Stuart Pilcher, C.B.E., general manager of the Manchester Corporation Transport Department, presented a paper on "Planning for Transport."

Dealing with the abandonment of tramways, he said that the number of trams in Lancashire had been reduced from 3,110 in 1927 to 1,649 now. In the present period of change the form of transport which should ultimately be adopted in place of trams was a matter for serious consideration. Districts in close contact should have one form of transport for the area, but at the present time there appeared to be no uniformity of policy. Such differences might prevent inter-running and therefore create inconvenience to the public. One authority might adopt trolley-buses and the other motor-buses so that through-running would be broken at the boundary. Application might be made by the authority operating motor-buses to run a through service, and the position could be visualised of both trolley-buses and motor-buses covering the same route and both operating at a loss.

Referring to his own undertaking, Mr. Pilcher stated that it was the Transport Committee's intention to continue the policy of tramway abandonment adopted by the Council on February 1st, 1939, as soon as conditions permitted. The 236 motor-buses and 77 trolley-buses which the Department had obtained before the war broke out had proved invaluable during a very difficult time.

Mr. Pilcher then dealt with inter-running in the Manchester area and also with the formation of a Joint Transport Board for South-East Lancashire which had been advocated for many years, setting out the benefits which would result from such centralised control.

## High-voltage DC Transmission

IN a paper presented at the annual meeting of the Swedish Society of Water-power Producers, Dr. I. Herlitz stated that the Asea combine had made promising trials with high-voltage DC transmission over long distances. In future it would be necessary to deal with the problem of transmitting electric power over distances as great as 1,000 kilometres, and the maximum voltage of 220,000 which had hitherto been possible would then be insufficient. There would, however, be difficulties in the economical transmission of AC under these circumstances, and that was why the possibilities of DC were now the subject of energetic study. The lines for the transmission of DC were cheaper than those for AC, but with DC difficulties were encountered at the power stations.—*Reuter's Trade Service.*

JUL 17 1943
I.M.E.A. ANNUAL MEETING

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Vol. CXXXII. No. 3422. JUNE 25, 1943 6d. WEEKLY

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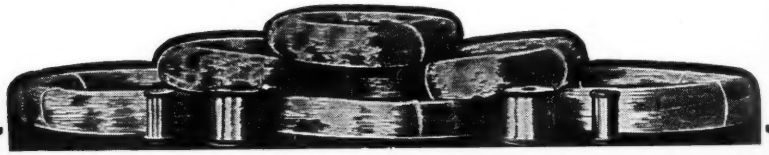

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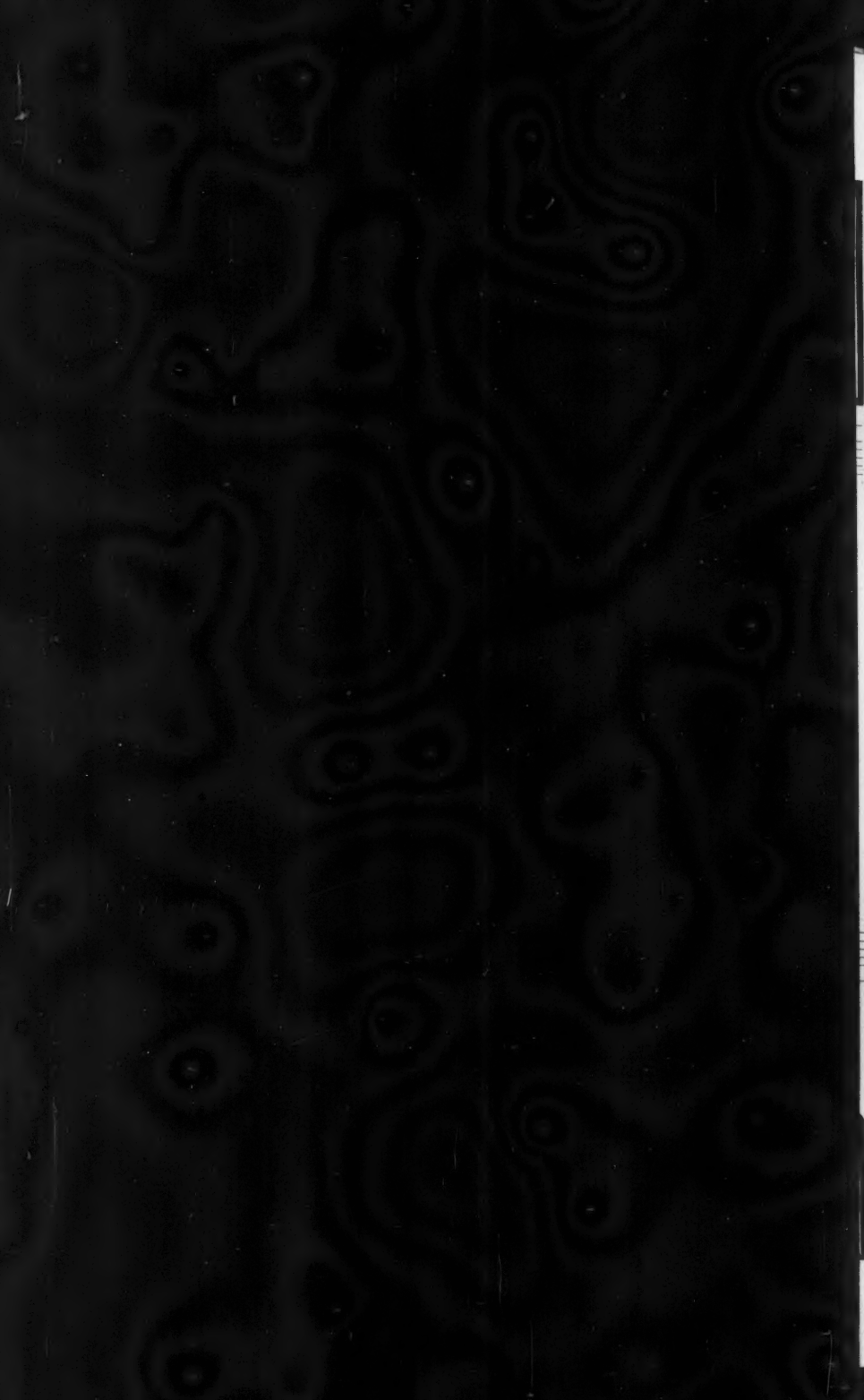

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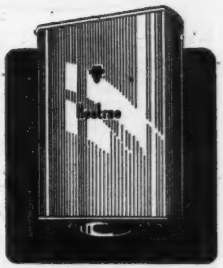


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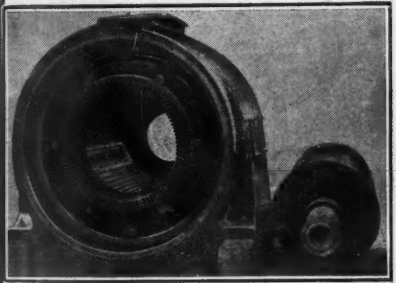

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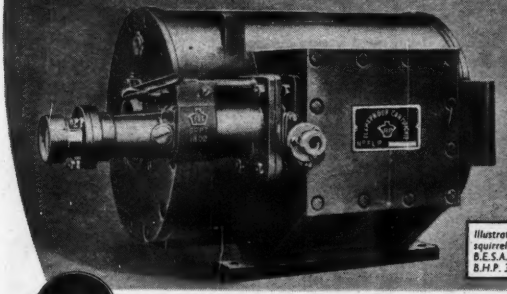

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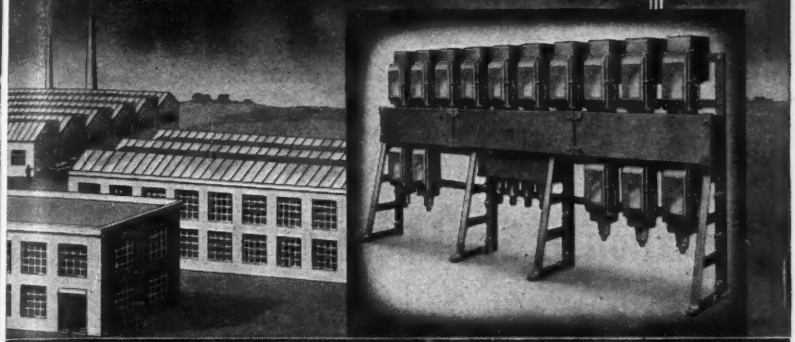

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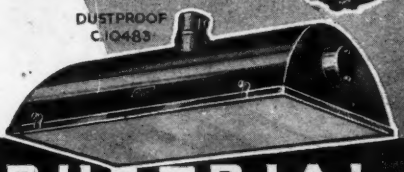


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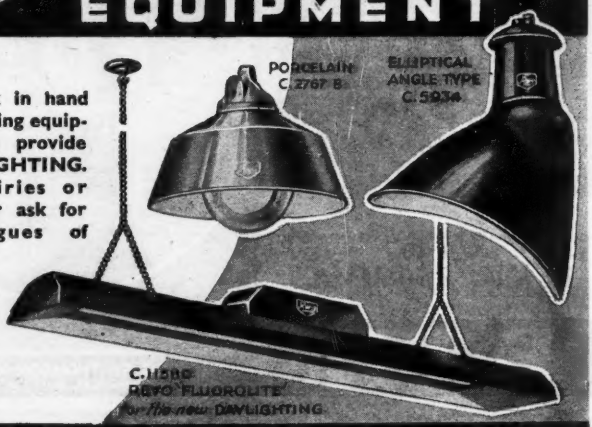


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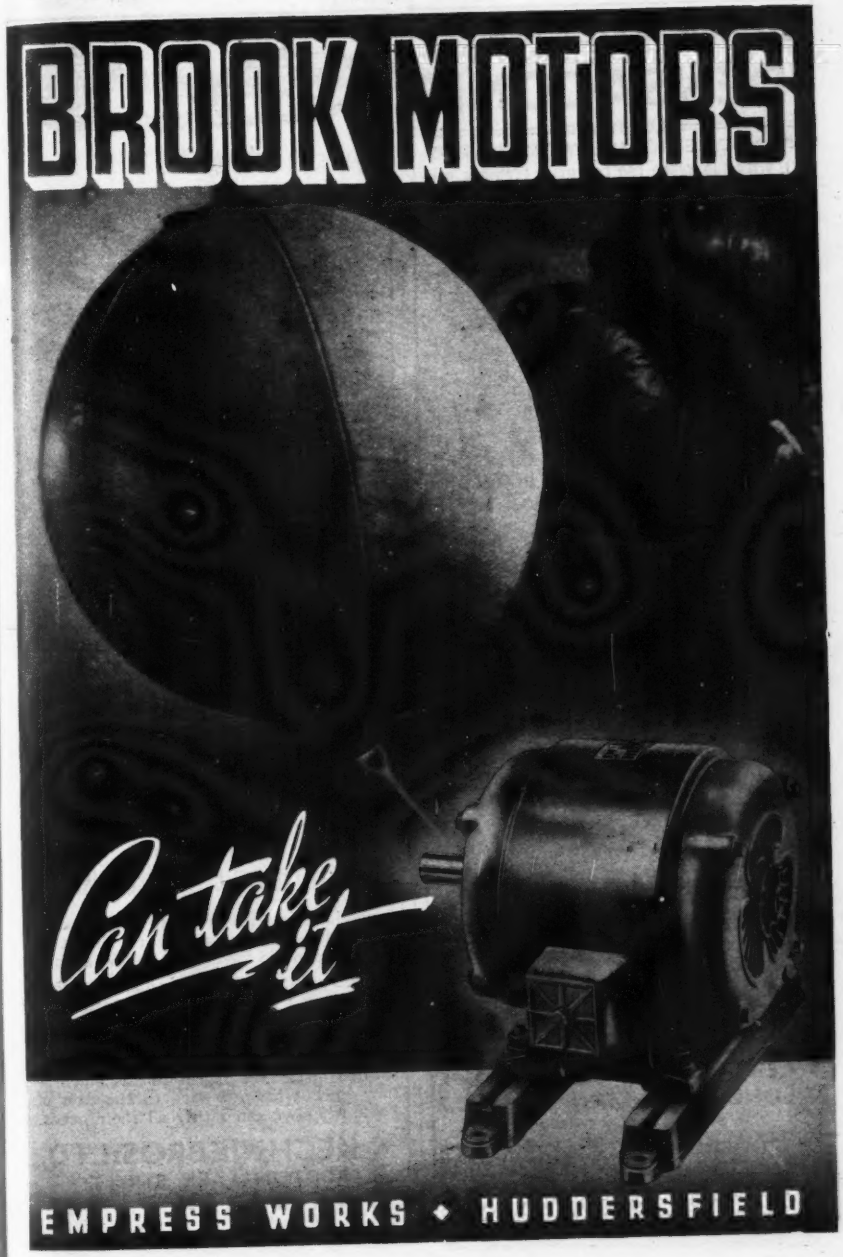
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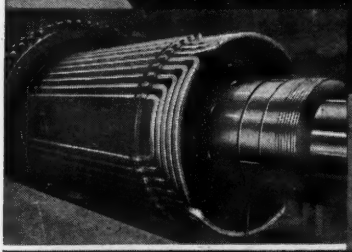

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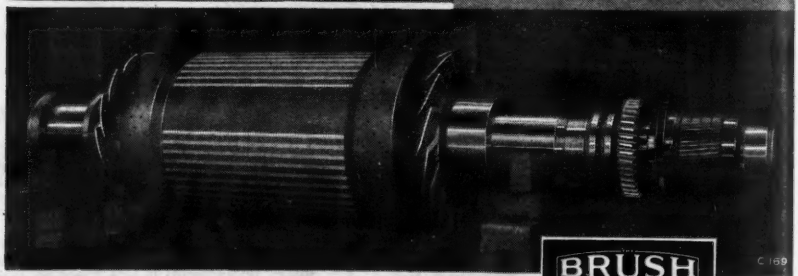

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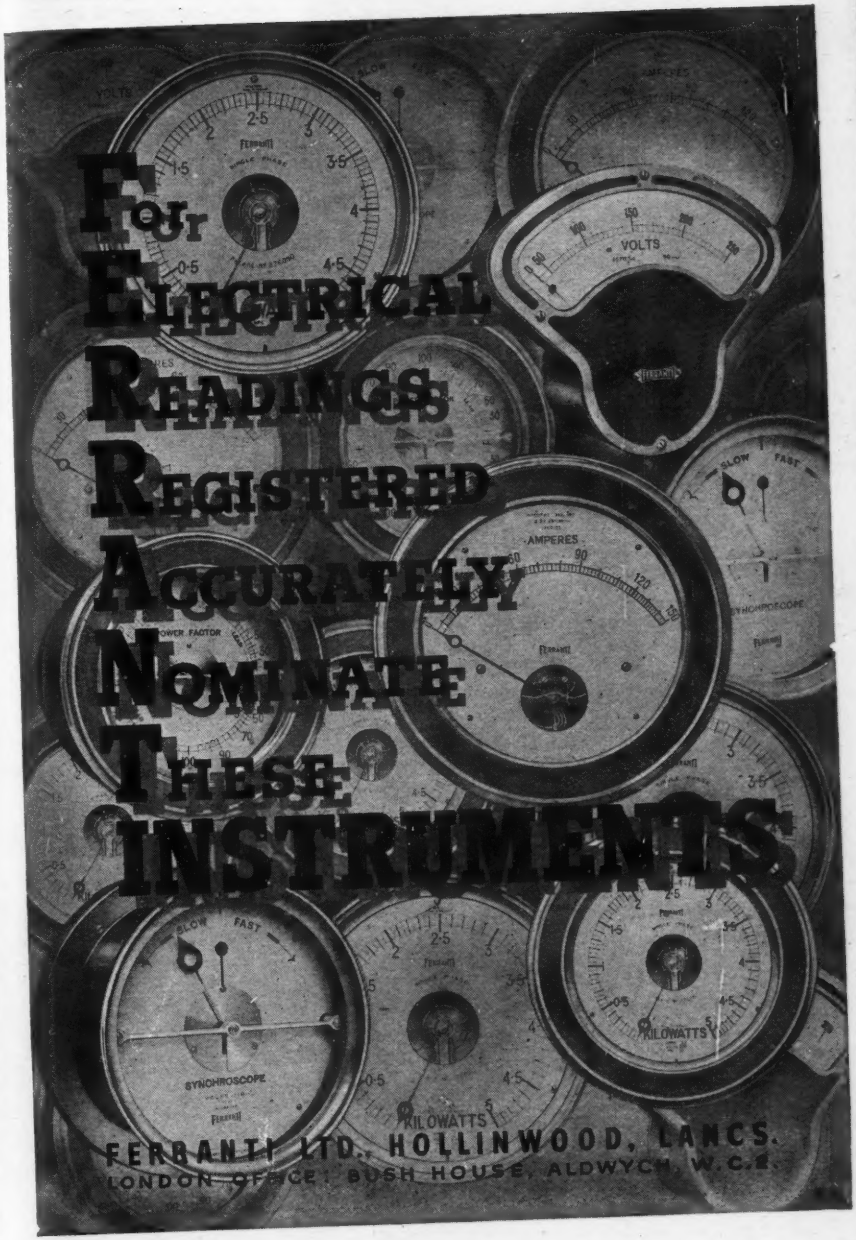


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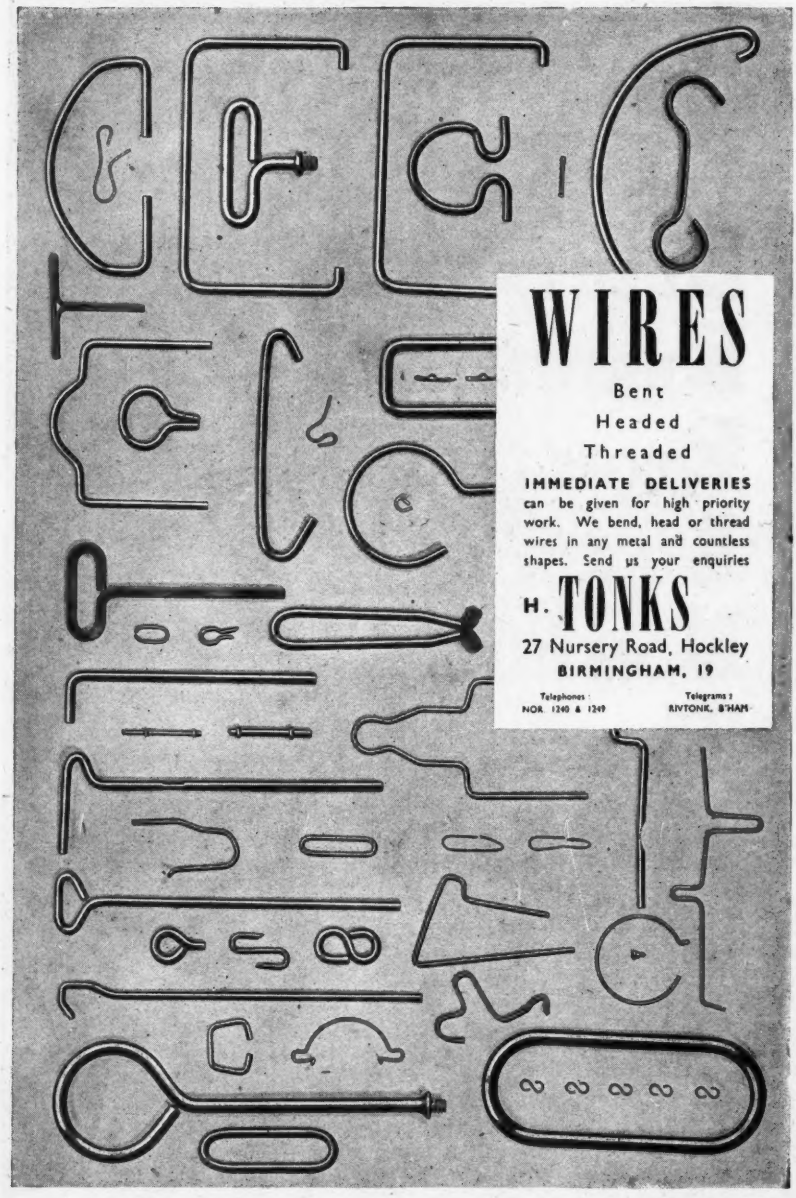
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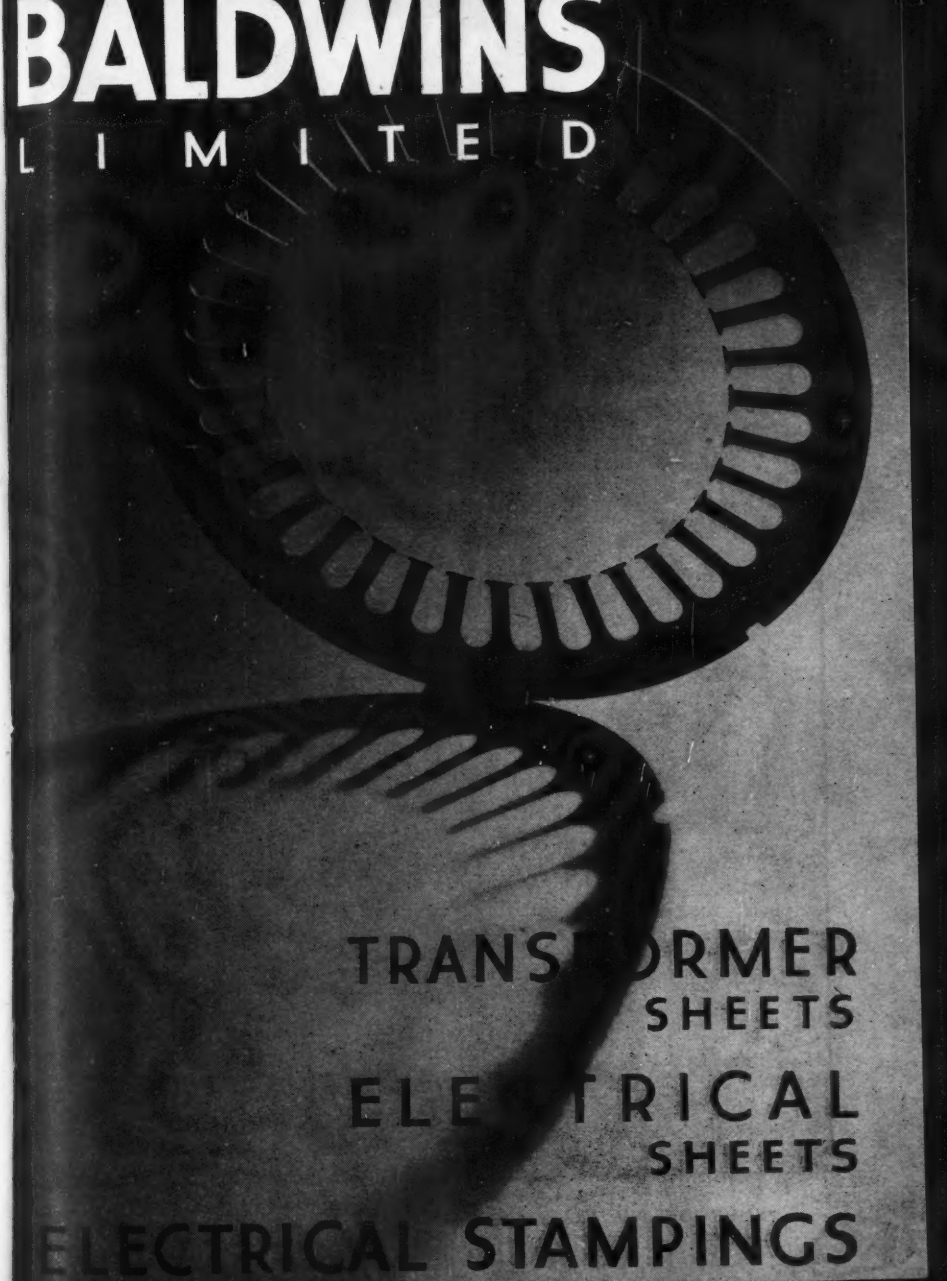

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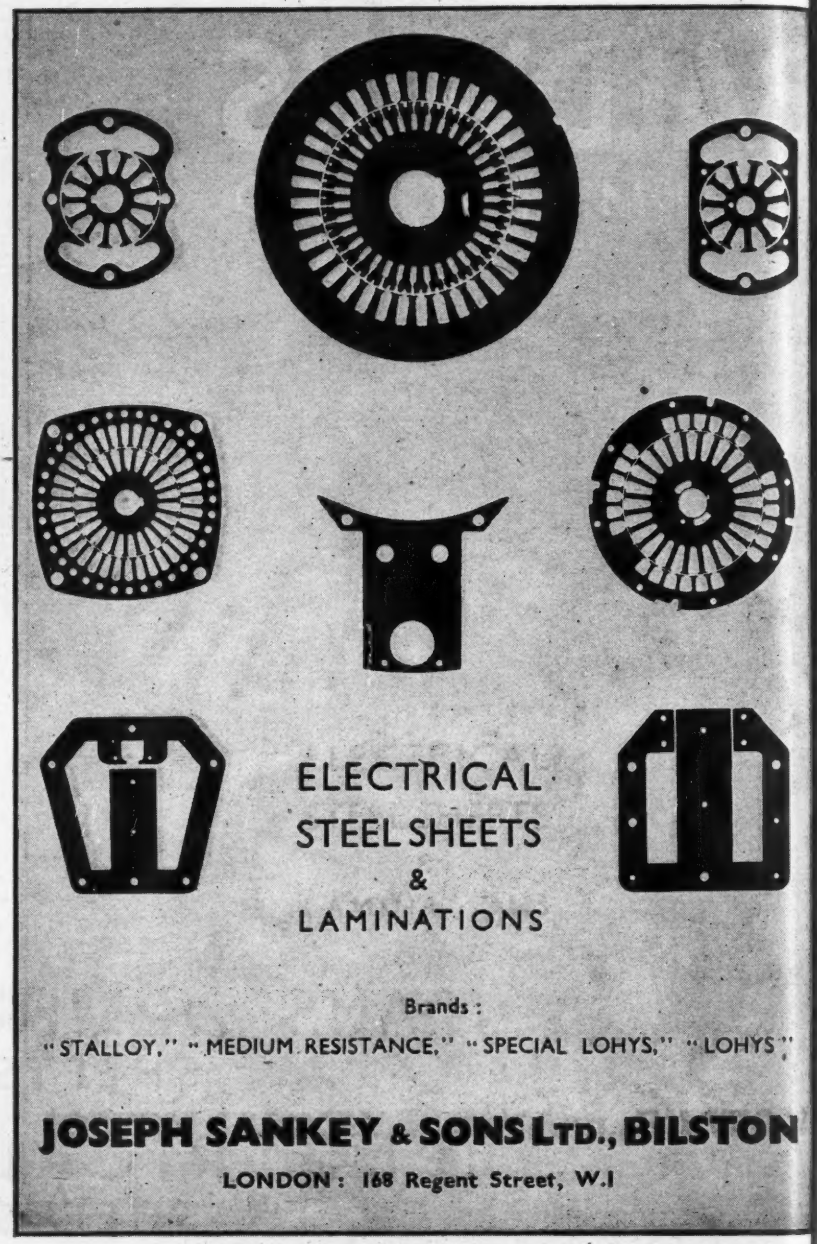
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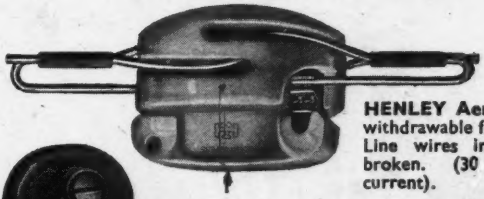

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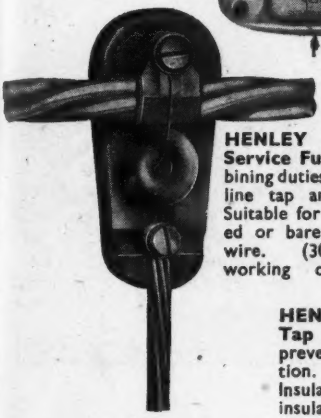

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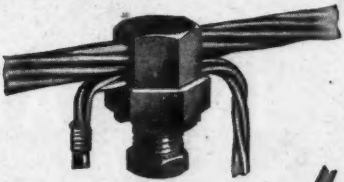

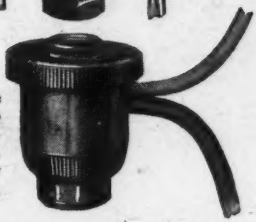

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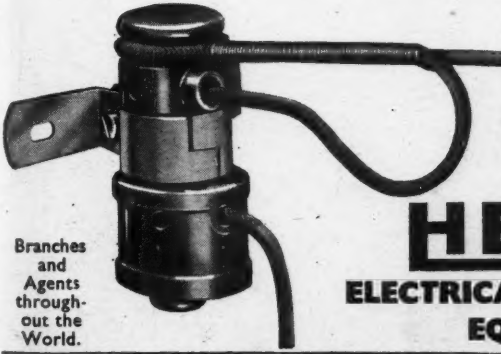

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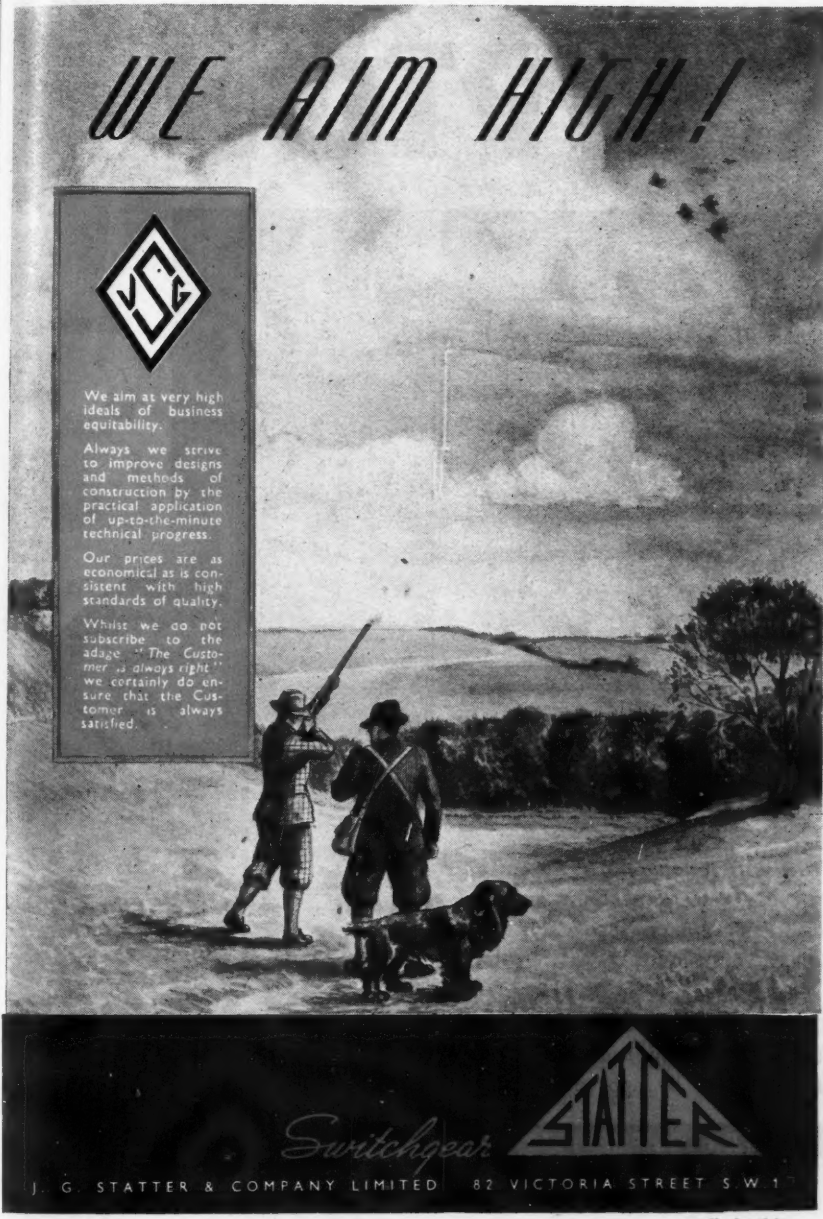
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* *Cowbit is a village in Lincs.*

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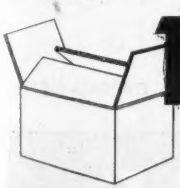
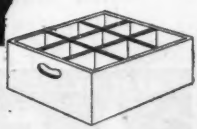


# MEDWAY
## CORRUGATED CASES



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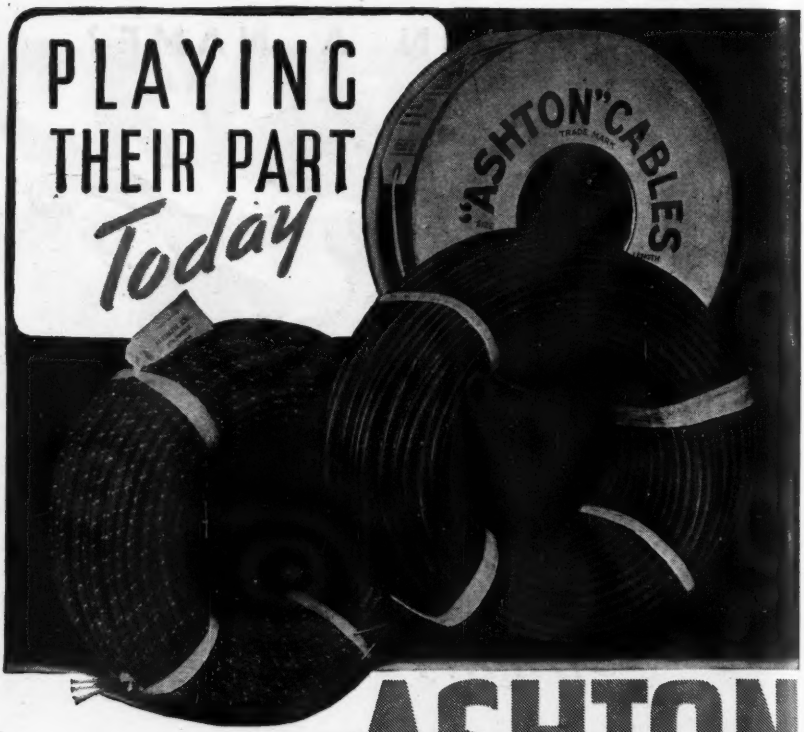


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"English Electric" Type 'J' cartridge-fuse links have given unequalled performance under service conditions in Underground Disconnecting Boxes, Feeder Pillars and Service Cut-outs.

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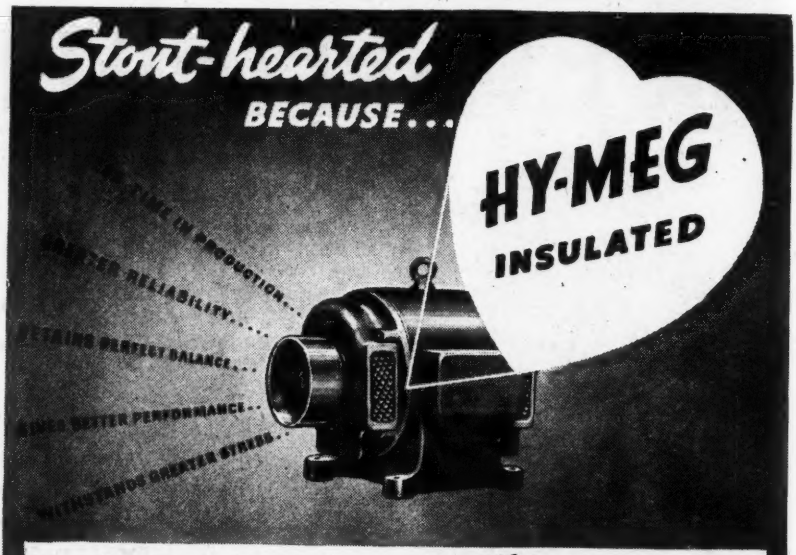


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*Don't keep in idleness any longer the capacity for overload of your motors.*
*They can be continuously overloaded by 10% with absolute safety.*
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## *Make a* **SMALLER** *motor do the job*

ISSUED IN COLLABORATION WITH BRITISH ELECTRICAL MANUFACTURERS

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**To those men and women in the factories, making the stuff to give the troops, and to the men of the Merchant Navy on whose cheerful devotion to duty our destinies depend, we also say 'Thank you!'**

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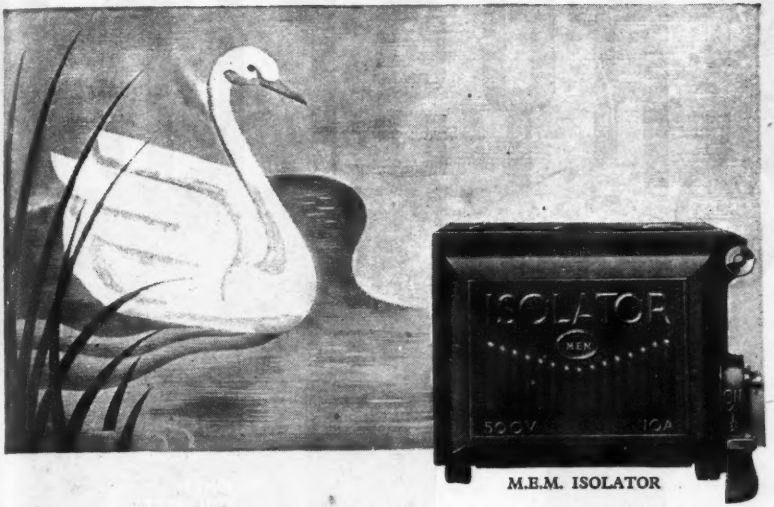


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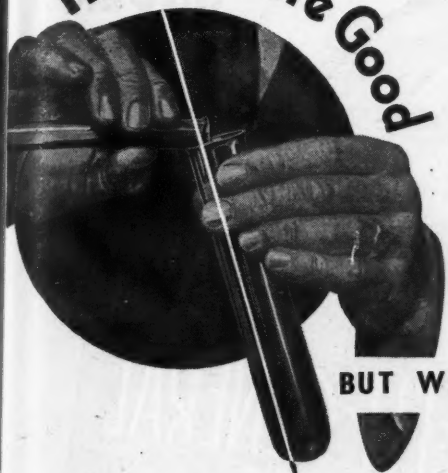

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Will there be a good test after a lapse of years, or will there be increasing trouble, and eventually the job to do again? The test of time is the acid test, but it has one drawback—it takes time to apply.

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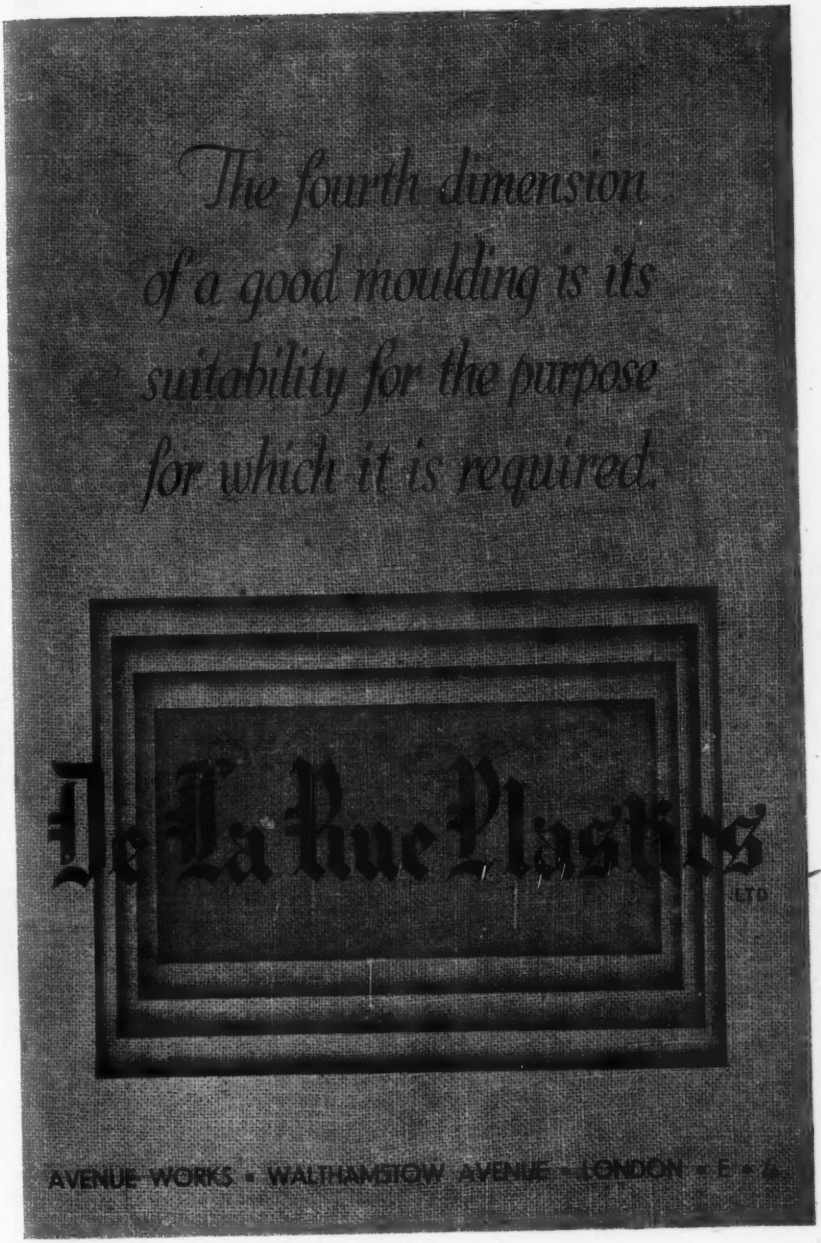
The fourth dimension
of a good moulding is its
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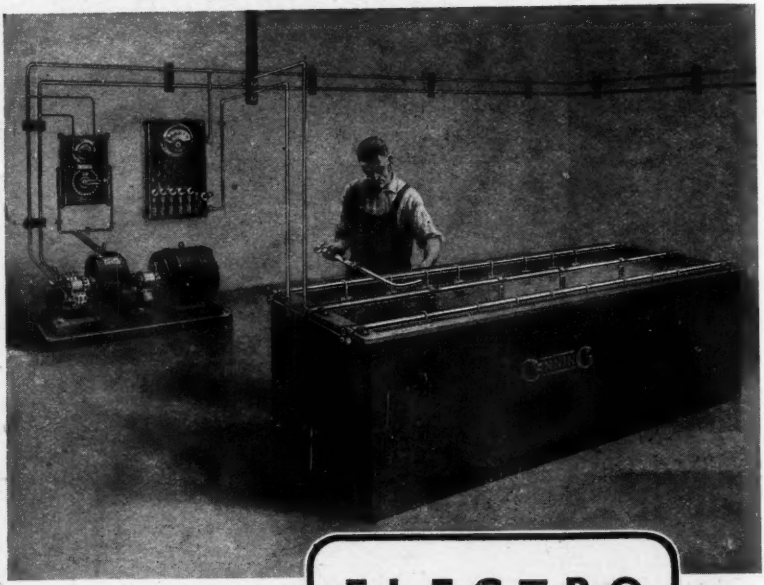

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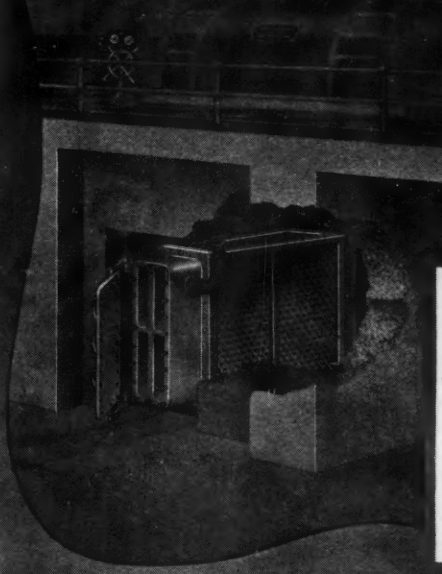
## ENCLOSED CIRCUIT AIR COOLERS

FOR VENTILATING TURBO-ALTERNATORS



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Tube bores accessible without breaking pipe joints.

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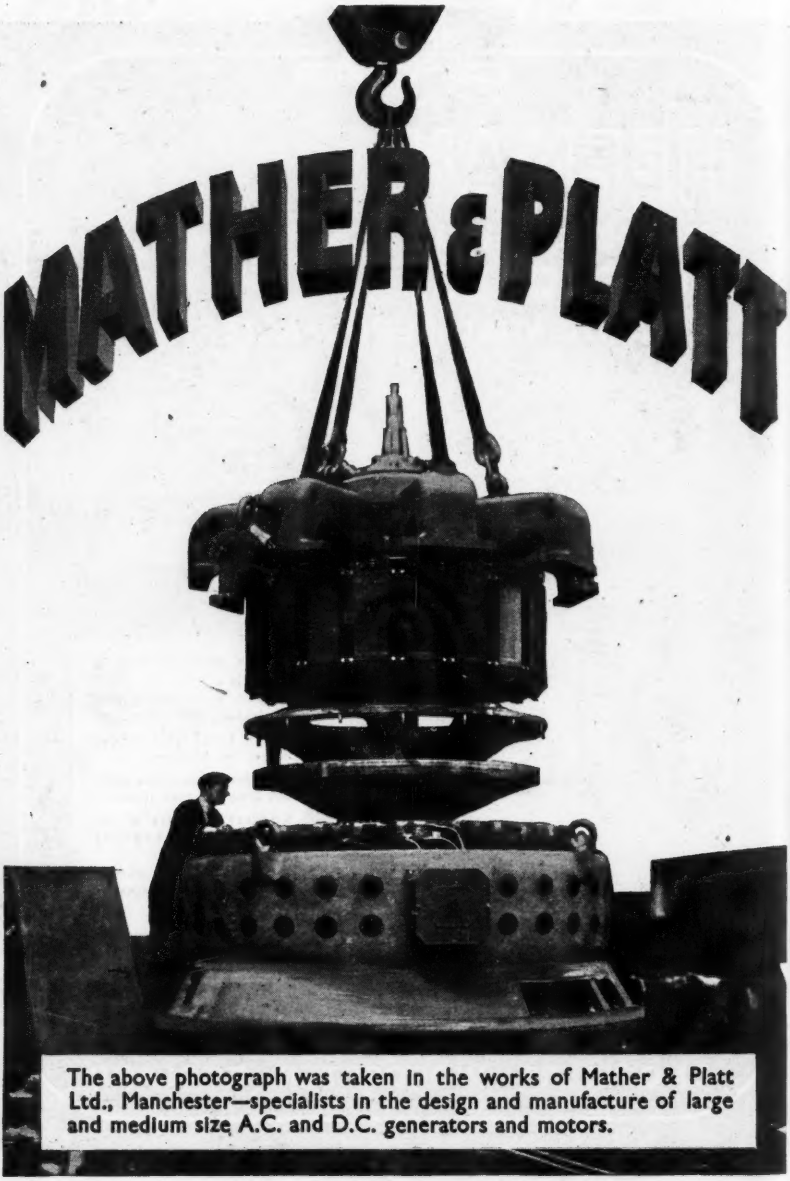


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ELECTRICAL CO. LTD.
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B

THE MODERN WAY OF LIFE

*THE DE HAVILLAND "ALBATROSS."*
*(Photo by courtesy of "The Aeroplane.")*,

Perched precariously amid struts and wires, and exposed to the full force of the elements the pioneers of aviation certainly had the courage of their convictions. It is doubtful whether even the most optimistic of them visualised the phenomenal developments which they were initiating, and it is difficult for the rest of us to realise that one generation has seen the birth of aviation and its progress to the present advanced stage. Electricity is the hand-maiden of aviation. It provides the vital spark for motive power, operates instruments, creates warmth and light, and enables communications to be established throughout an aircraft and with its bases on land and sea. Some indication of the extent to which the two industries co-operate is seen in the wide and comprehensive range of cables specially designed for aircraft.

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June 25, 1943

Managing Editor:
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Technical Editor :
C. O. Brettelle, M.I.E.E.

Commercial Editor :
J. H. Cosens


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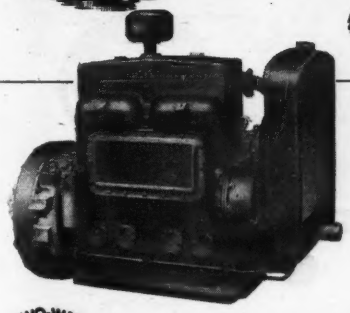

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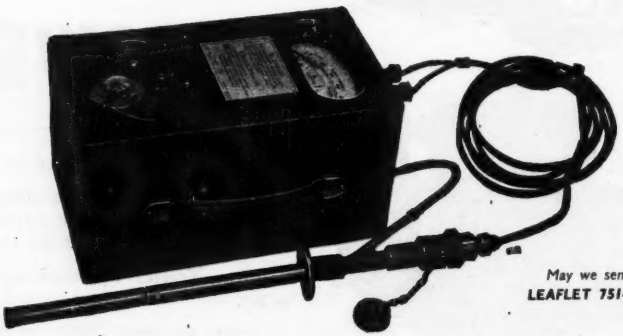

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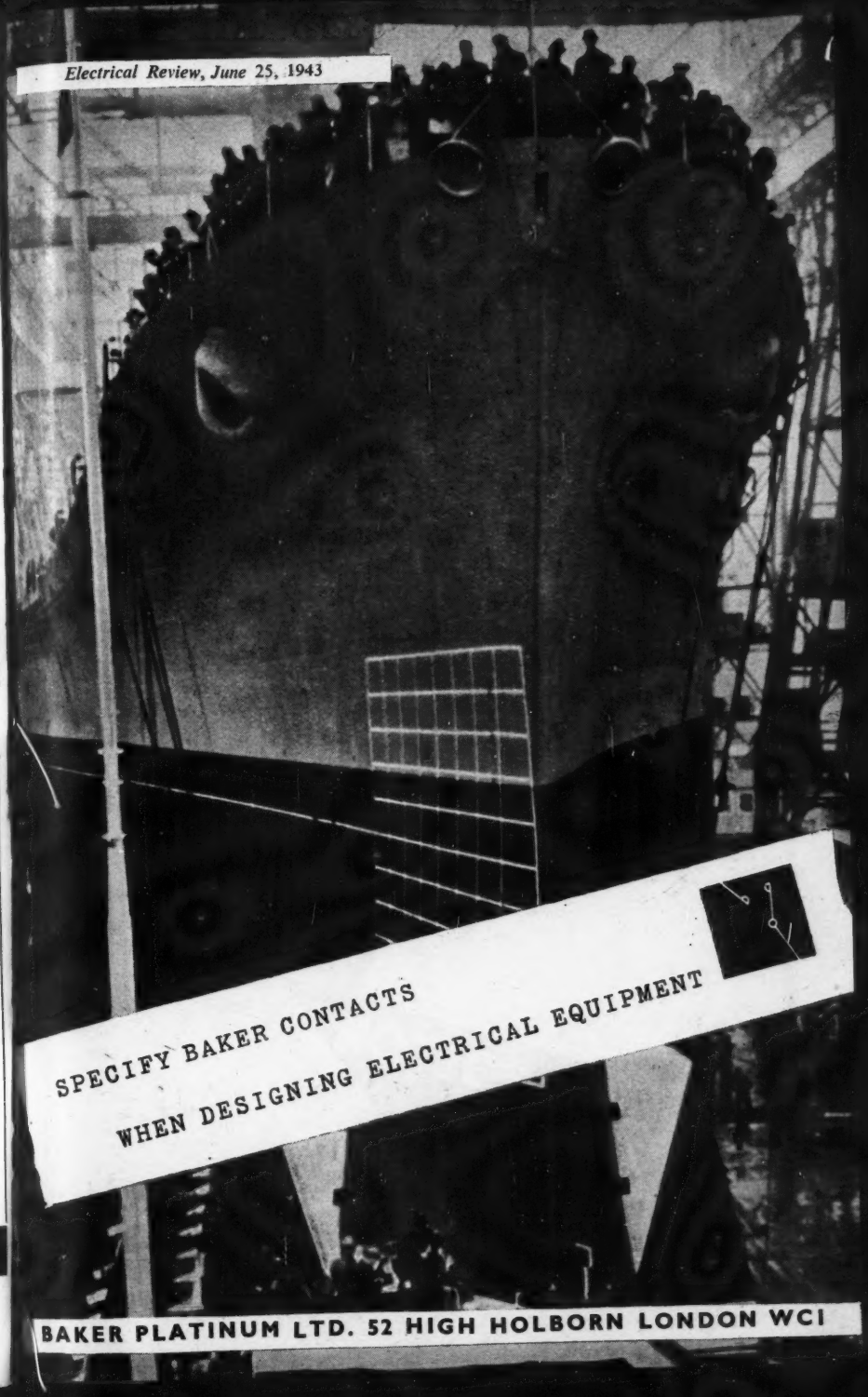
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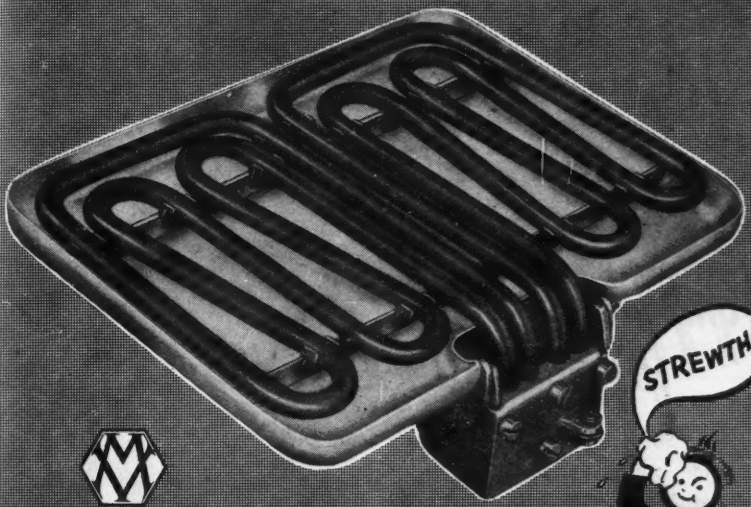


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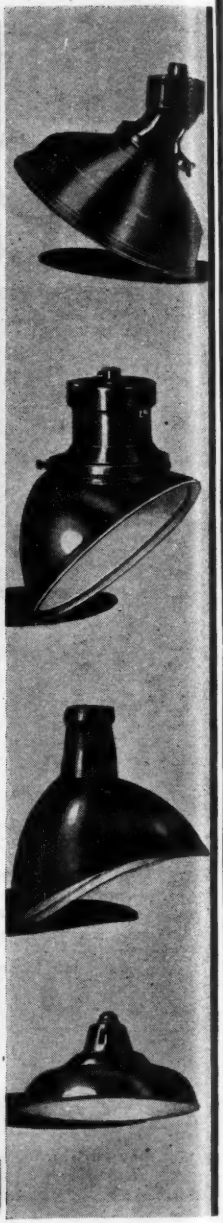

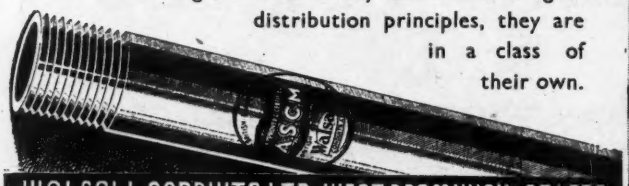


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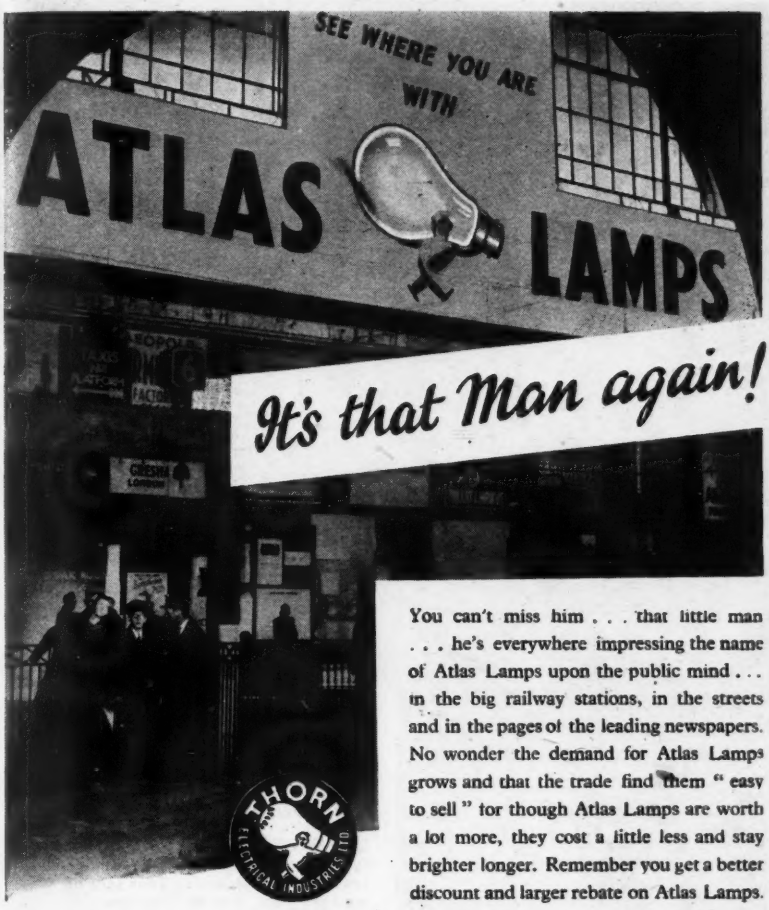


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La belle ville de Paris, par example, avec ses Boulevards et ses Cafés—Les Champs Elysées . . . Tout sera de nouveau en pleine lumière . . . Les Tuileries, Montmartre, Le Café de la Paix, Le Bal Tabarin.
La France, comme tous les autres pays du monde, aura besoin d'éclairage—d'éclairage R.E.A.L. et nous, l'organisation R.E.A.L. que de travail pour nous!
R · E · A · L

*Issued by Rowlands Electrical Accessories Ltd., R.E.A.L. Works, BIRMINGHAM 18*

# A SIMPLE WAY TO INCREASE WORKS EFFICIENCY

INSTEAD of basing increased output on extension of space, equipment and personnel, industry should seek higher production levels by securing greater efficiency on the part of each worker, and by speeding up the training of those under instruction.

**THE VITAL IMPORTANCE OF LIGHTING.** Throughout every stage of organised training, from "raw" recruits to skilled hands, lighting plays a vital part in achieving and maintaining full efficiency. Operatives can work better, more quickly, with less personal strain and consequently fewer accidents and "spoils," if they have really good seeing conditions.

**A SCIENTIFIC PROBLEM.** Good lighting is not simply a matter of increasing the number and power of the lamps. Lighting in industry is a scientific problem, and its correct solution not only increases efficiency, but may save power and therefore fuel. Lighting is a job for the expert.

**AN ADVISORY SERVICE WITHOUT OBLIGATION.** Those concerned in the lighting of factories are invited to make use of the Mazda Industrial Lighting Advisory Service which has been established for their assistance. Without obligation, a lighting specialist will examine and report on present lighting arrangements. He may confirm that they are correct, or be able to make suggestions which will result in increased efficiency, happier workers and higher output. You are invited to write for details.

**BTH RESEARCH AIDS INDUSTRY**

*BTH Research Laboratories have made an intensive study of both the physical and psychological aspects of lighting in wartime industry, and their knowledge and experience are at your free disposal through the*

# MAZDA

***Industrial Lighting Advisory Service***

THE BRITISH THOMSON-HOUSTON CO. LTD., CROWN HOUSE, ALDWYCH, LONDON, W.C.2

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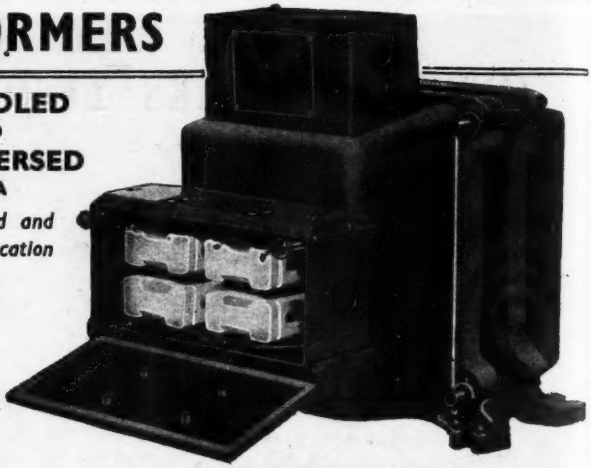

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Ask a Soldier what he knows about Lister's, and if in peace-time farming was his job, he'll tell you about the engines, separators, ploughs and and other Lister machines that were his before the war. To-day he knows that Lister's are still his trusted friends. He won't give you details, but when he gets home again he'll again specify Lister's.

R. A. LISTER & CO. LTD., DURSLEY, GLOS.

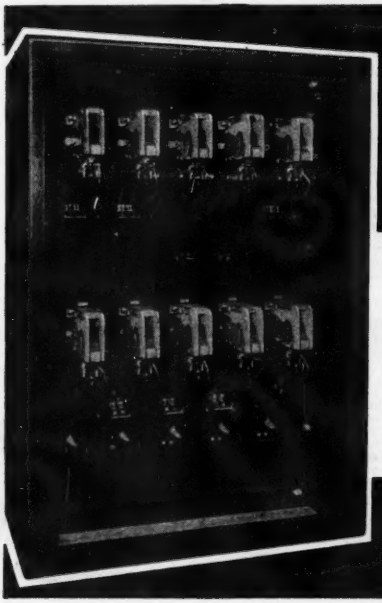

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*Illustration shows IGRANIC Contactor Panel for control of Travel motion of 6-ton Slab Charger for Steel Mill.*

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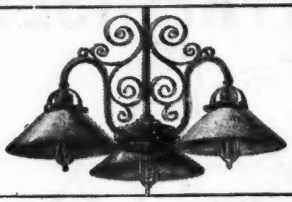

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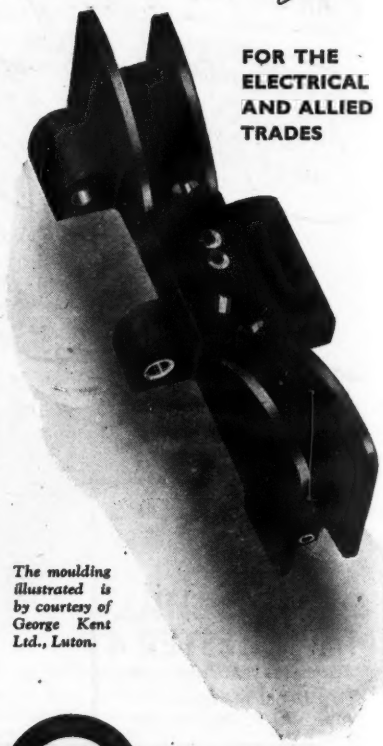

*The moulding illustrated is by courtesy of George Kent Ltd., Luton.*

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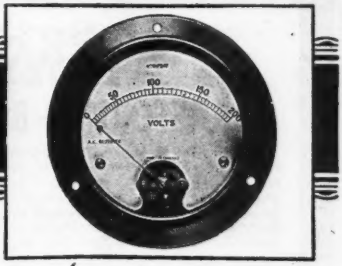


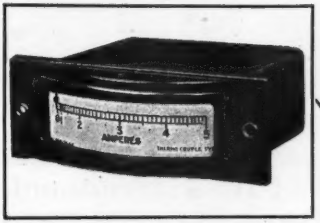


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Projecting or flush, 2", 2½" and 3½" dial diameter.

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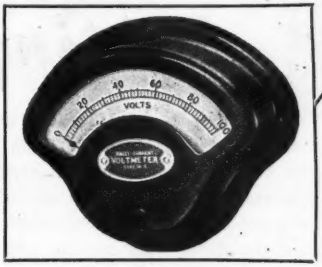


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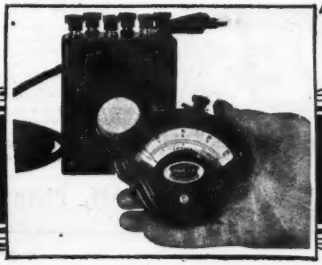
Comprising a miniature current transformer and a moving iron type ammeter, having an overall range from 50 milliamperes to 200 amperes, for 50 cycles, A.C.



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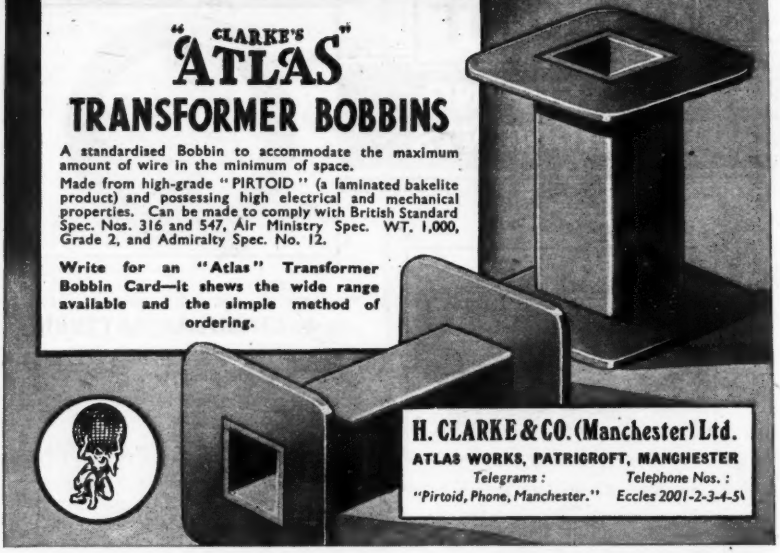

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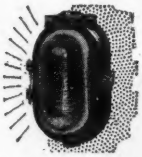

Prismatic lighting fittings have long been recognised as the most suitable for the efficient lighting of corridors, stairways, subways, etc., in either public or private buildings. As pioneers of these fittings we have a fund of experience to draw on and our advice is gladly given. Our range of Wigan and Lacent fittings is sufficiently wide to meet all normal requirements and a variety of special requirements also. Why not get in touch with us when considering your lighting problems? Illustrated leaflets and specifications available gladly.

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Wigan and Lacent fittings comprise a full range of units to meet any peculiarities of situations, space available and wiring which may arise.

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**"LACENT"**

The Lacent prismatic lighting fitting illustrated represents the most up-to-date directional lighting equipment available. Compact and tamper proof, it is ideal for lighting corridors, stairways, subways, etc., in either public or private buildings. A popular unit at a popular price, manufactured by the pioneers of prismatic lighting

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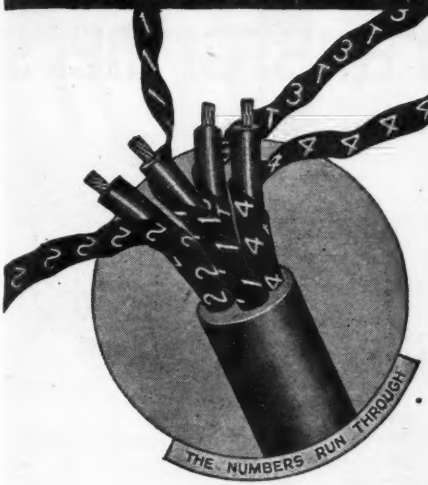


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Each Core Numbered throughout its entire length.

**ROTUNDA IDENTIFICATION CLOTH** is over-printed with separate numbers . . . it can be cut to any width.

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FOOLPROOF — SAFE

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**IDENTIFICATION** is an important matter in cable installation . . .

Numbered cores save time and avoid wrong connections . . . . . .

*Write for Specimen*

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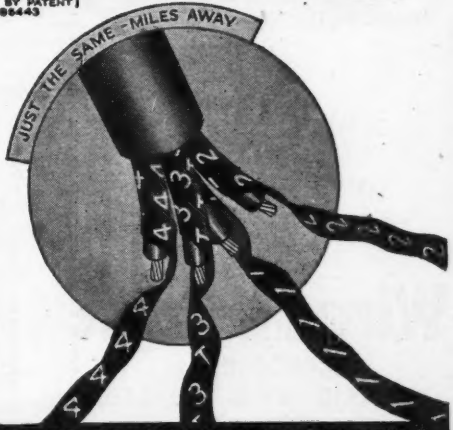


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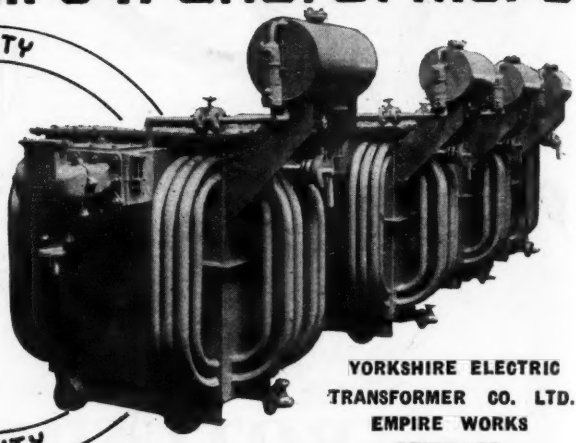

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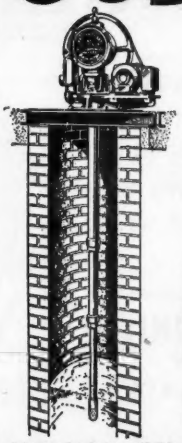
**FOR WELLS & BOREHOLES OF EVERY DEPTH**



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Excellent Performance

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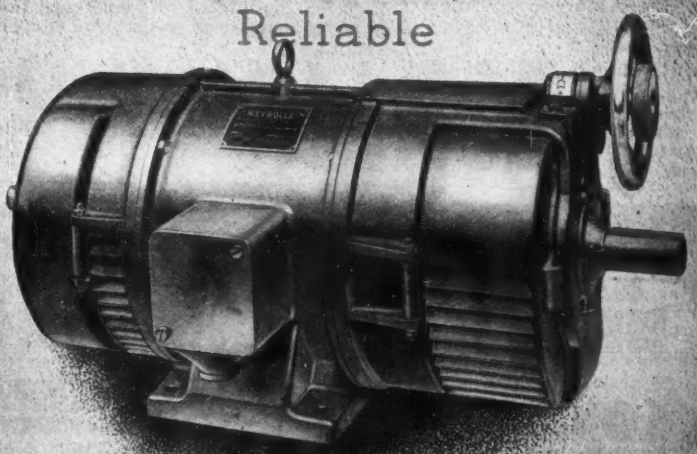

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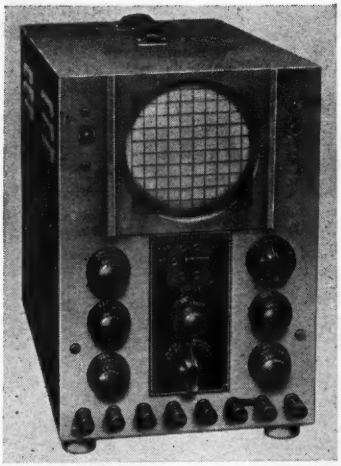

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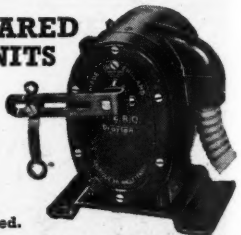

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*Extract from one of the descriptive leaflets in the Motor Control booklet, describing some multi-motor starter switchboards for Boiler House Auxiliaries drives.*

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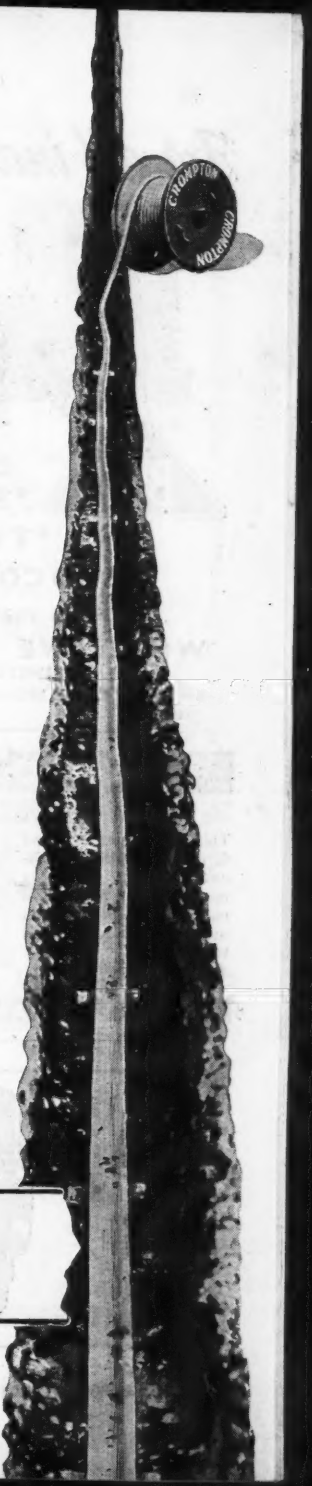


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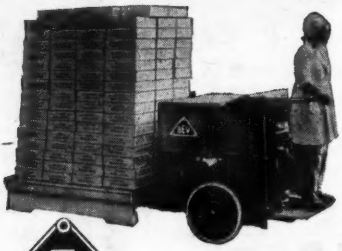

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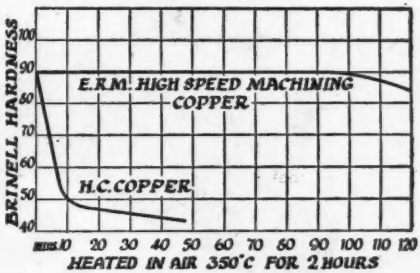


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# CLASSIFIED ADVERTISEMENTS

**ADVERTISEMENTS** for insertion in the following Friday's issue are accepted up to **First post on Monday**, at Dorset House, Stamford Street, London, S.E.1.

**THE CHARGE** for advertisements in this section is 2/- per line (approx. 8 words) per insertion, minimum 2 lines 4/-, or for display advertisements 30/- per inch, with a minimum of one inch. Where the advertisement includes a Box Number there is an additional charge of 6d. for postage of replies.

**SITUATIONS WANTED.**—Three insertions under this heading can be obtained for the price of two if ordered and prepaid with the first insertion.

**REPLIES TO** advertisements published under a Box Number if not to be delivered to any particular firm or individual should be accompanied by instructions to this effect, addressed to the Manager of the ELECTRICAL REVIEW. Letters of applicants in such cases cannot be returned to them. The name of an advertiser using a Box Number will not be disclosed. All replies to Box Numbers should be addressed to the Box Number in the advertisement, c/o ELECTRICAL REVIEW, Dorset House, Stamford Street, London, S.E.1. Cheques and Postal Orders should be made payable to ELECTRICAL REVIEW LTD. and crossed.

**Original testimonials should not be sent with applications for employment.**

## SITUATIONS VACANT

*None of the vacancies for women advertised in these columns relates to a woman between 18 and 41 unless such woman (a) has living with her a child of hers under the age of 14, or (b) is registered under the Blind Persons Acts, or (c) has a Ministry of Labour permit to allow her to obtain employment by individual effort.*

CHIEF Engineer or General Technical Assistant. Applications are invited from persons competent to assume the duties of chief engineer or general technical assistant of copper wire mill and general rubber cable factory in India. Attractive terms and prospects to suitable experienced applicant not over 40 years of age. Only men of wide experience in modern high speed copper drawing methods, rough and bright annealing, tinning, stranding, mixing and calendering, insulating, vulcanising, braiding, cotton covering, enamelling and testing entertained. Liberal service agreement, passages and home leave. Full particulars to—Box 3672, c/o The Electrical Review.

CLERICAL Assistant required, with good knowledge of electrical equipment as handled by wholesaler.—London Electrical Co., 92, Blackfriars Road, S.E.1. 47

ELECTRICAL Wholesale Distributors require a Representative with connection amongst industrial users. E.L.M.A. lamps and all proprietary lines stocked. Salary no object to right man. Apply—Box 3659, c/o The Electrical Review.

MALE and Female Assistant Technicians required in Electric Lamp Factory. Knowledge of lamp manufacture not essential. Female applicants between the ages of 18 and 41 may not be engaged without previous reference to the local Employment Exchange. Apply by letter, giving age and full details of education and career to date and technical and administrative experience, if any, to—Cryselco Limited, Kempston Works, Bedford. 3608

M.K. Electric, Ltd., Edmonton, require experienced man for Contracts and Order Dept. Must be familiar with Government specifications and full knowledge of electrical accessories. Exempt from military service. Appointment will be for war period. Please give full particulars of training and experience in confidence, to—Sales Manager, M.K. Electric, Ltd., Wakefield Street, Edmonton, N.18. 3678

REPRESENTATIVE young assistant, technical, required, not liable for military service, for Glasgow branch of large manufacturing firm of electrical engineers. State age, experience, and salary required.—Box 3657, c/o The Electrical Review.

SALES Representative required for important district in North-west to sell E.L.M.A. Lamps. Only men not liable for military service and with experience should apply.—Box 3639, c/o The Electrical Review.

## APPOINTMENTS FILLED

Dissatisfaction having been so often expressed that unsuccessful applicants are left in ignorance of the fact that the position applied for has been filled, may we suggest that Advertisers notify us to that effect when they have arrived at a decision. We will then insert a notice free of charge under this heading.

## SITUATIONS WANTED

A.M.I.E.E. seeks management of installation, maintenance, etc., of large works.—W., 33, Blenheim Park Rd., Croydon. 5009

CHARGE Engineer, 36, Class F, desires change, Home Counties preferred, 20 years' experience, exempt. free.—Box 5031, c/o The Electrical Review.

CHARTERED Electrical Engineer, with long technical, sales experience, London area, would act for firm as liaison between them and Ministries, also area agent.—Box 5035, c/o The Electrical Review.

COMPETENT Managing Elect. and Mech. Engr., 39 (invalided), 20 yrs.' Govt., industrial and domst. elect. and const. wks., H. and L.T., dsgn., estmg., maintce., seeks perm. post, mftr. or Sup. Co. £450 p.a. —Box 5034, c/o The Electrical Review.

ELECT. Engineer (34), exempt, seeks change, S. or Home Counties. Consultant or contractor, planning and supervision, power and lighting, or maintenance. D.O. experience.—Box 5003, c/o The Electrical Review.

ELECTRICAL Eng. (46), own business 12 years, requires position. Could assume complete charge, administration, office, secretarial, also practical side. London or Home Counties.—Box 5030, c/o The Electrical Review.

ELECTRICAL Engineer (45), seeks responsible position, installation and/or maintenance. Twenty years' technical and commercial experience as high-class contractor.—Box 5028, c/o The Electrical Review.

ELECTRICAL Engineer, 48, capable estimating, planning, supervising installations, applicable process-timing, job-costing, recording, inter-communications signals, publicity, units, mains, impulse, rental, sales, seeks change. Company intending expansion, modern development, industrial concerns, agreement if desired, energetic, car.—Box 5029, c/o The Electrical Review.

EXECUTIVE just under 40 and exempt from military service desires progressive position. Wide experience in the electric lamp business. Used to taking full control of sales and office staffs. Sound knowledge production. Energetic, keen, past record will bear any investigation. Present salary £1,000, but would be prepared to consider a substantial measure of remuneration by results in a position yielding scope for progress.—Box 3662, c/o The Electrical Review.

PRACTICAL Technician, Grad.I.E.E. standard, requires progressive post electro-mechanical work, Southern Counties.—Box 5016, c/o The Electrical Review.

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### ELECTRIC MOTORS & DYNAMOS

WE hold one of the largest stocks of New and Second-hand Motors. Secondhand machines are thoroughly overhauled. Inspection and tests can be made at our Works.

For Sale or Hire. Send your enquiries to:—

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Telephone: 5512-3 Clerkenwell. 13

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STANNINGLEY, NEAR LEEDS.

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**400-VOLTS, 3-PHASE, 50-CYCLES SWITCHGEAR**

1 × 1,000-amp. oil-immersed Switch Cubicle by E. E. Co.
1 × 500-amp. " " " " E. A. Co.
1 × 500-amp. draw-out type, oil-imm. Switch by E. A. Co.
1 × 400-amp. oil-immersed Switch by Ellisons.
1 × Bus-Bar Ellison Chamber with
2 × 300-amp. size Ellison oil-immersed Switches.
1 × Bus-Bar Chamber with 4 Bus-Bars,
2 × 500-amp. oil-immersed Switches,
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11 × 250-amp. Switch Fuses.

**MIDLAND COUNTIES ELECTRICAL ENGINEERING CO., LTD.,**

GRICE STREET, WEST BROMWICH.

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**MOTOR GENERATOR SETS**

FOR voltage or frequency conversion, speed control, regenerative engine testing and many other purposes, built up of available stock plant.

OVER 1,000 RATINGS ACTUALLY IN STOCK HERE.

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Telephone: Northern 0898.

26

**TWO TURBO ALTERNATORS, 2,750 kW**

BY Lancashire Dynamo & Motor Co. Ltd., Belliss & Morcom Ltd., 410 volts, 4,850 amps., 3,437 kVA, 3,000 r.p.m., 3-phase, 50 cycles, size T.A. 640, with exciters, 130 volt, 240 amps., 31 kW, 3,000 r.p.m., shunt wound, size 7½". Steam Turbines by Belliss & Morcom Ltd., usual pressure gauges and fittings. Flowmeters, steam strainers. Aria Automatic Regulators. Cambridge Index Thermometers. Cambridge Pyrometers for 335 lbs. steam pressure at 650 degrees superheat. Complete with pumps, switchboard panels, etc.

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Output 45 kW, 460/230 v.

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A.C. to D.C. Gen. Set, input 6,600 or 3,300 or 500 volts, output 440/480 v., 300 kW, like new, can be used vice versa.—J. Gerber & Co. Ltd., Wembley, Middx. 3666

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ALTERNATING Petrol Set, 15 kVA, 230/1/50, 1,000 revs., self contained on bed.—J. Gerber & Co. Ltd., Wembley, Middx. 3664

ALTERNATOR, 98 kW, 220/260/300 volts, 1/50, 1,000 revs., with exciter for welding purposes.—J. Gerber & Co. Ltd., Wembley, Middlesex. 3667

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ELECTRIC Pumps for sale, new, suitable for suds, air raid shelters, garden watering, etc.—Southern Ignition Co. Ltd., 190, Thornton Road, Croydon. 34

FERRANTI and C. & H. D.C. House Service Meters, reconditioned and guaranteed, 5, 10 and 20 A.; quarterly and prepayment.—Kippax Bros., Boot Street, Burnley. Tel. 2363. 33

FOR disposal, 1 20-h.p., 400/3/50, 1,460/960/720/460-r.p.m. Change Pole Oerlikon Motor, with drum type controller. Preferably in exchange for 1 70-h.p., 400/3/50 Auto-Transformer Starter. Can be seen running by appointment.—Mark Fletcher & Sons Ltd., Whitefield, near Manchester. 3612

FOR sale, Generating Sets, 2½ kVA, 230/1/50, for petrol, and 3 kW, 230 v. D.C., for crude oil. Also 5 kW, 220 v. D.C., fully automatic petrol.—Fyfe, Wilson & Co. Ltd., Bishop's Stortford. 3675

FOR sale, New Tarpaulins, Covers, Portable Shelters, etc. All sizes available for transport, agricultural and engineering purposes against priorities.—George Cohen, Sons & Co. Ltd., Contractors' Tools Section, Wood Lane, London, W.12. Tel. Shepherds Bush 2070. 3470

FULLY Automatic Electric Sterilizer in good condition, 230/250 volts, with tray, 18" × 8½" × 8".—Barker, Manning Road, Felixstowe. 5038

LAMP Lowering and Suspension Gear, T.R.S., lead and other Cables, Winches (hand), hundreds of thousands in use, Searchlights (sale or hire), Carbon Rods, Ebonite, Fibre, Hightensite, Porcelain House-wiring and other Cleats, Reels and Knobs, Mirrors, Lenses, etc.—London Electric Firm, Croydon. 3559

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LEAD-covered and Armoured Cables, P.I. and V.I.R., various special lines at low prices.—Edwardes Bros., 20, Blackfriars Road, London, S.E.1. 5021

MEGGER, 220 volts, 10 megs., in 2 cases, £12 12s.; 500-volt Insulation Tester (50 megs.) and D.C. Voltmeter combined, £15 15s.—Box 5017, c/o The Electrical Review.

MONOMARK. Permanent conf. London address. Letters redirected. 5s. p.a. Write—BM/MONO53, W.C.1. 15

MOTOR Generator Sets and Convertors, all sizes and voltages from ¼ kW up to 500 kW in stock.—Britannia Manufacturing Co., Ltd., 22/26, Britannia Walk, City Road, London, N.1. Telephone, Clerkenwell 5512, 5513 and 5514. 28

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PHONE 98 Staines. 20-h.p. Ruston Crude Oil Engine with 110-vo. Dynamo; 250-kW Browett Steam Set, 220 vo. D.C.; 50-kW Hindley Steam Set, 440/220 vo. D.C.; 90-kW Browett Steam Set, 110 vo. D.C.; Large Coal Pulverizer by Yeadon; Weir Feed Pump, 10½" × 8" × 16".—Harry H. Gardam & Co. Ltd., Staines. 30

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STAFF Time Checking and Job Costing Time Recorders (all makes) for quick cash sale. Exceptional condition. Write—Box 528, Smiths, 100, Fleet St., London, E.C.4. 31

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71-kW, 460-v., 550-revs., compd., three bearing "L.D.M."—Greenhalgh Bros., Burtons Field Mill, Atherton. 3670

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SHEFFIELD: Coborn Works, Tinsley.
SWANSEA: Prince of Wales Dock.
NEWCASTLE-ON-TYNE: 12, Grey Street.
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BATH: Lower Bristol Road.
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**GEORGE COHEN, SONS & CO. LTD.**

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ACCUMULATOR Plates (old) and lead Peroxide; as actual smelters we pay top price. Also old storage batteries, transformers and whole installations purchased.—Elton, Levy & Co., Ltd., 18, St. Thomas Street, S.E.1. Hop 2825-6. 39

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TRANSFORMERS, single and three-phase. All types up to 10 kVA.—Woden Transformer Co. (Phone, Wolverhampton 22829), Thornley St., Wolverhampton. 11

## MISCELLANEOUS

A Postal training in Electrical Engineering Power, Radio. Individual correspondence tuition by highly qualified engineers with wide teaching and technical experience. Elementary or advanced courses. Preparation for recognised examinations. Pre-service training specially arranged. —G. B., 18, Springfield Mount, Kingsbury, N.W.9. 49

ADVERTISER wishes to contact a few of the most eminent engineers in the country, or men who have held the highest appointments in prominent engineering concerns, to criticise manuscripts of a practical and technical nature dealing with Civil, Mechanical, Electrical, Aeronautical, Automobile and Radio Engineering. The work is interesting, non-repetitive, and could be carried out leisurely in spare time. A high fee is offered. Write in strictest confidence, stating position, salary, etc., to—Box 3641, c/o The Electrical Review.

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LESLIE Dixon & Co. for Dynamos, Motors, Switchgear, Chargers and Telephones.—214, Queenstown Road, Battersea, S.W.8. Telephone, Macaulay 2159. Nearest Rly. Sta.: Queen's Road, Battersea (S.R.). 18

STAFF Identity Passes that Embody the Photographs of employee, now being supplied to firms on Government contracts. Utility Installations. Forgery proof; Celluloid Encased; Inexpensive; any size staff; anywhere; distance no object. Write for particulars and specimens from—Miles & Kaye, Ltd., Pass Specialists, 9, Southampton Place, High Holborn, London, W.C.1. Est. over 50 years. 5011

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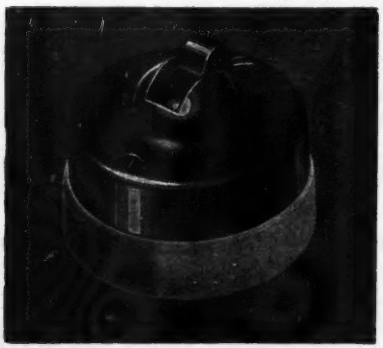

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## COMPANY MEETINGS

### BRITISH ELECTRIC TRACTION

#### Value of Private Enterprise

THE Forty-seventh Ordinary General Meeting of The British Electric Traction Company, Limited, was held on June 18th, in London.

Mr. Richard J. Howley, C.B.E. (the Chairman) said that for many years past they had been able to show increases in their gross revenue, but this year they had to record a slight decrease. The revenue amounted to £760,293, compared with £767,588 for the preceding year. The reduction was due in the main to smaller distributions by two of their subsidiary companies necessitated by the incidence of taxation. Apart from taxation, their expenses amounted to £59,868, an increase of £4,902. Taxation required £51,553 compared with £105,750 in the preceding year and after providing for debenture stock interest, their profit was £569,393, an increase of £42,000. The directors recommended the payment of the same dividends as last year.

Of their many interests the most important was their large investment in companies providing road passenger transport services in the Provinces. The B.E.T. group of companies owned some 8,500 omnibuses, which operated approximately 243 million miles during 1942 and carried some 1,400 million passengers. Their operating companies had established a reputation for the excellent public services they provided. That he attributed to enterprise in providing for the public needs, economy in operation, and civility and attention to their passengers. All that had been achieved with capital provided by this company and other shareholders; in other words the capital had been found at no cost to the taxpayer or ratepayer.

#### Changing Forms of Transport

Forms of transport were apt to change quickly, and they were all wondering just now what effect the war would have on air travel and what its reactions would be on other forms of transport. State ownership was ill-suited to administer changing services where enterprise and imagination were required for success.

I do not suggest that State control of public utilities is unnecessary; we have it already, and in my view it is a function of the State. But control and regulation to be just and efficient should not be mixed up with State trading. We want State control to be honest and wisely exercised without favouritism.

Important public men have pointed to the wonders of production by war factories as justifying the extension of State trading after the war, but I have failed to find any reference by them to the cost at which such work is carried out. Under war conditions output, rather than costing, is the first consideration; but in peace-time economy is vital for cheap travel and success.

Cheap and efficient road passenger transport services are essential for the better distribution of the population between town and country areas. It is a task for private enterprise, encouraged and assisted by the State.

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The report was adopted. 3669


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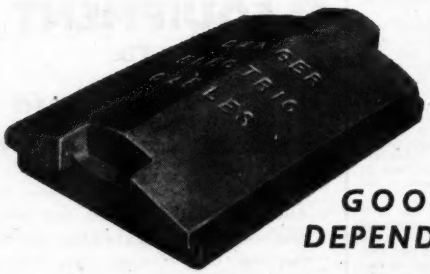

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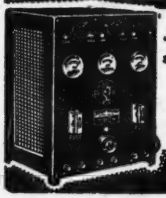

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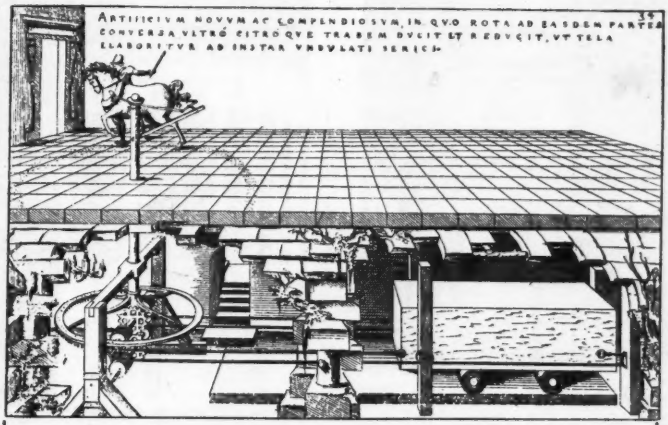
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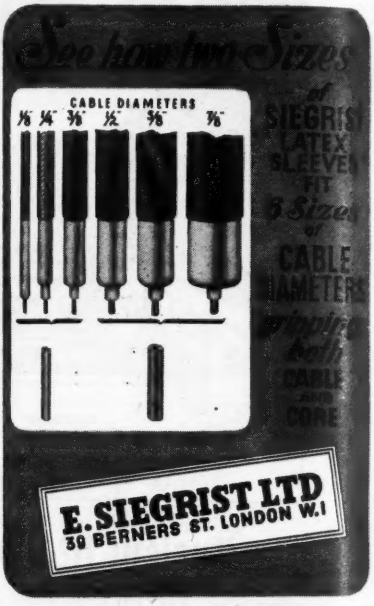
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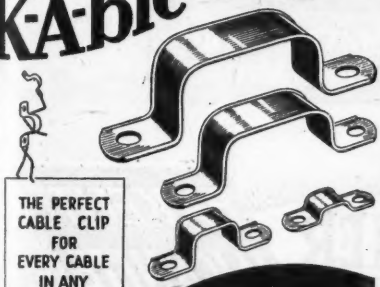

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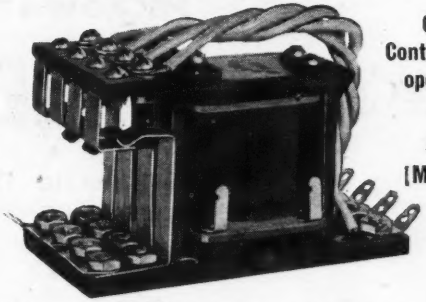

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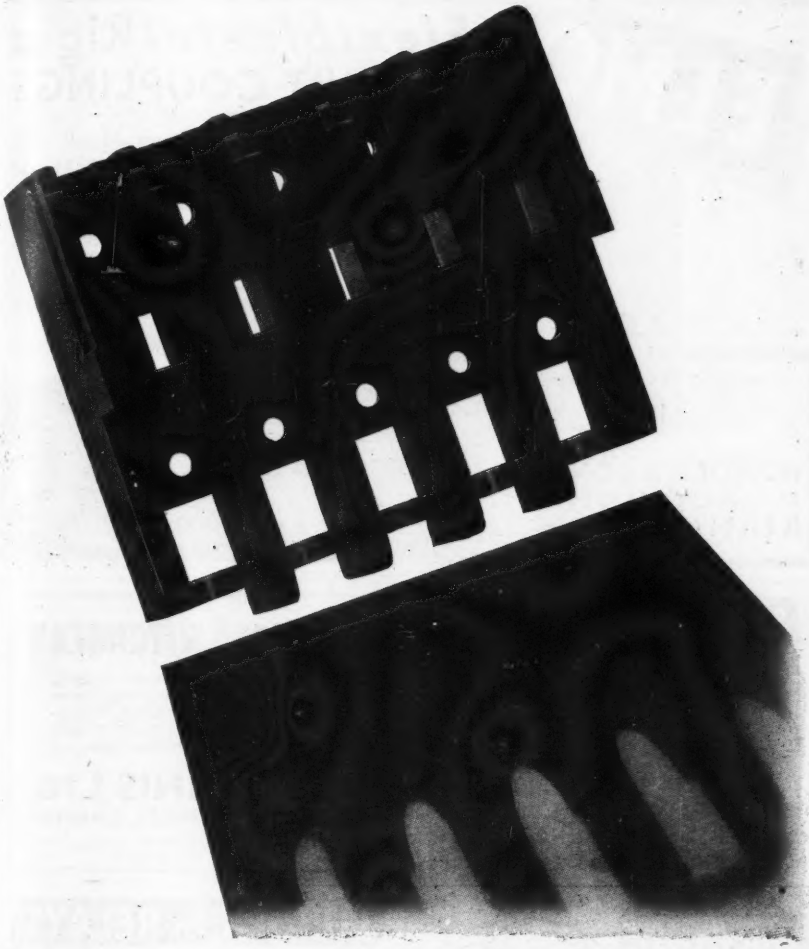

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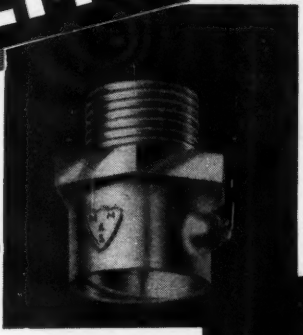

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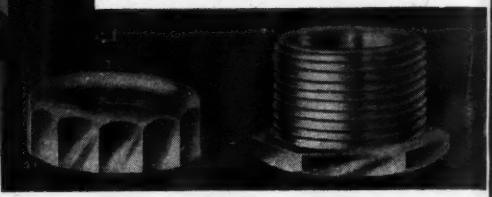

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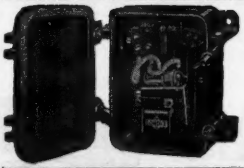
**Electrical Manufacturers and Stockholders**

# LONDEX *for* RELAYS



**RELAY LQA approved and passed by the G. P. O.**

*Ask for Leaflet SPN/ER*

**LONDEX · LTD**

MANUFACTURERS OF RELAYS

ANERLEY WORKS 207 ANERLEY ROAD · LONDON · S.E.20 PHONE SYDENHAM 6040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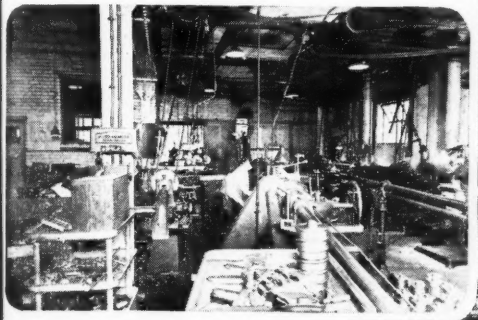
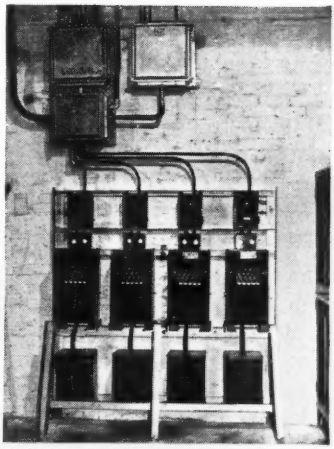
# STATIC 3-PHASE OPERATION

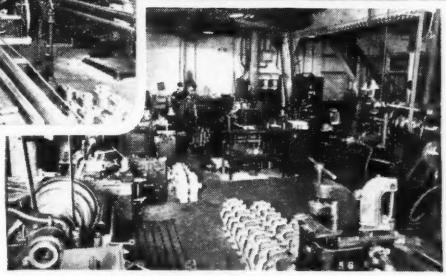
*from single-phase mains supply — by*

WESTINGHOUSE

## PHASE CONVERTERS







*Views in a London Factory showing a phase converter installation through which some of the three-phase machinery illustrated is operated from single-phase supply mains. Since the original installation made in this factory, two repeat equipments, identical in size and output, have been ordered and put into service.*

The photographs show only the second installation, which, like the other two, consists of a bank of four 4 kVA converters, as shown at top. Some of the machines are motorised and others fed by overhead shafting driven by a 10 H.P. motor, a total of 70 H.P., and all operated from the one-phase converter group. It was not possible to include all the machines in the photograph.

The first installation in this factory is in another shop doing extremely heavy work, while the third operates another machine shop, and also a 20 H.P. 3-phase motor (driving a compressor), which was installed in place of a single-phase motor because of the former's improved characteristics and reliability of starter gear.

The phase converter itself has no moving parts whatever.

If you wish to operate 3-phase machines, but have only a single-phase supply, investigate the WESTINGHOUSE STATIC PHASE CONVERTER SYSTEM.

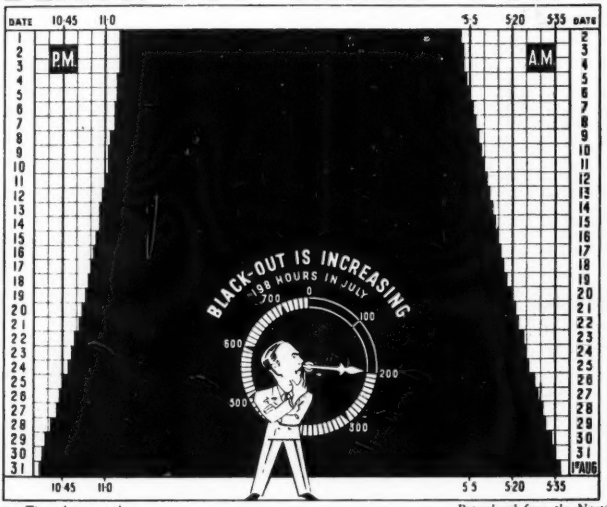
First of all send for book D.P. IIM.

**WESTINGHOUSE BRAKE & SIGNAL CO. LTD., PEW HILL HOUSE, CHIPPENHAM, WILTS.**

SUPPORT THE ELECTRICAL INDUSTRIES RED CROSS FUND

# The Time to Plan . . . .

## BLACK-OUT CHART FOR JULY..




★ *Times shown are those for the London area.*

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Summer it may be, but black-out hours are lengthening again. It is time to think of lighting and how best it can be applied to assist output during the still darker months. Does your lighting system need any revision? . . . If so, complete your plans in good time. The subject of lighting always brings Osram to mind — for wherever you find good lighting, there you will find OSRAM.

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